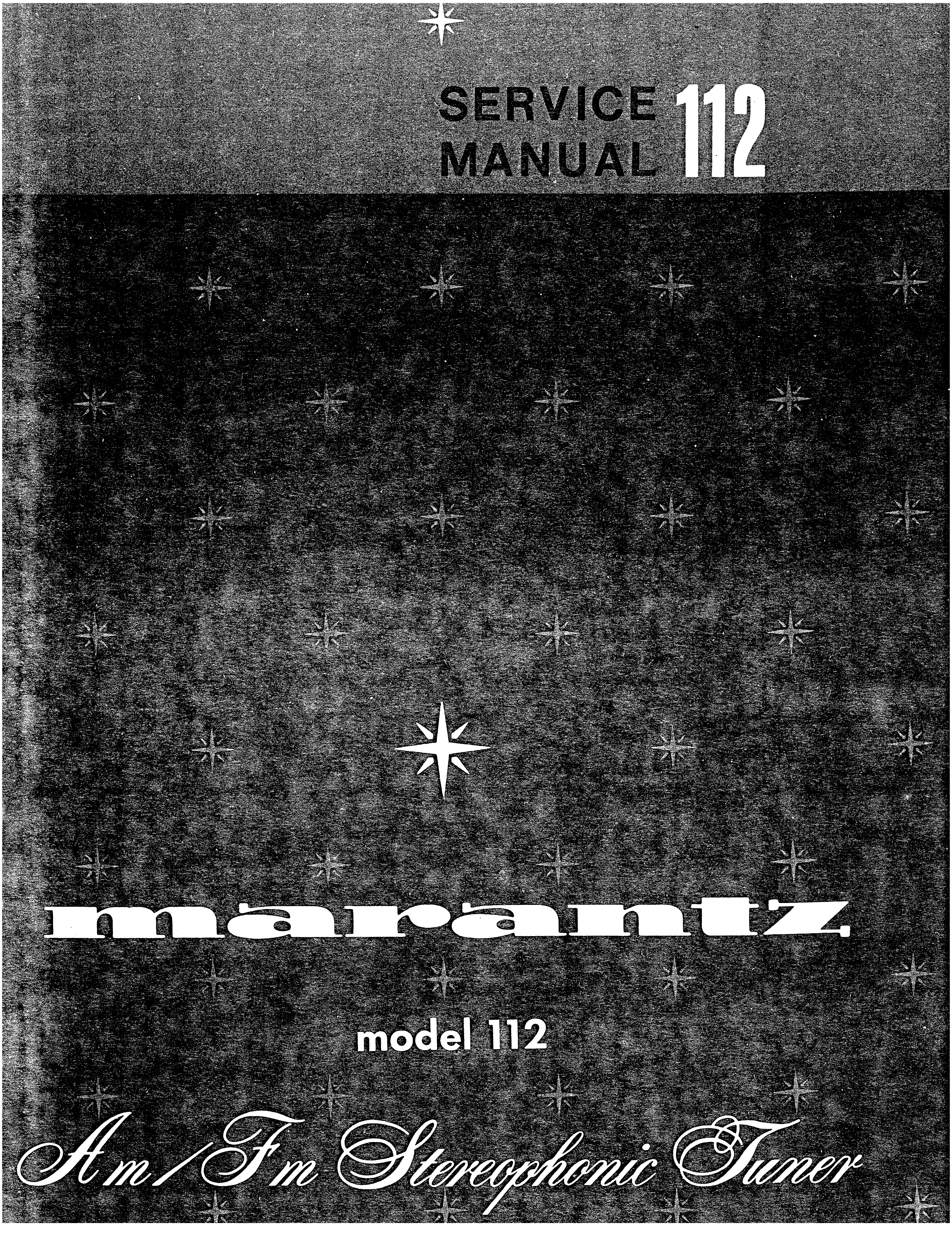

SERVICE MANUAL 112

marantz

model 112

Am/Fm Stereophonic Tuner

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1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 112 Stereophonic Tuner.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of the operation of the tuner.

The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A belief description is included for parts which can be usually be obtained through local suppliers.

2. AM TUNER

The AM Tuner section of the Model 112 is contained in the AM/IF circuit package consisting of one IC H202 (AN217) and three transistors. The IC is shown in Figure 1 in the block diagram form. The respective three transistors serve as RF amplifier, IF amplifier for intensifying the gain of the IC, and audio amplifier for magnifying the detected audio signal.

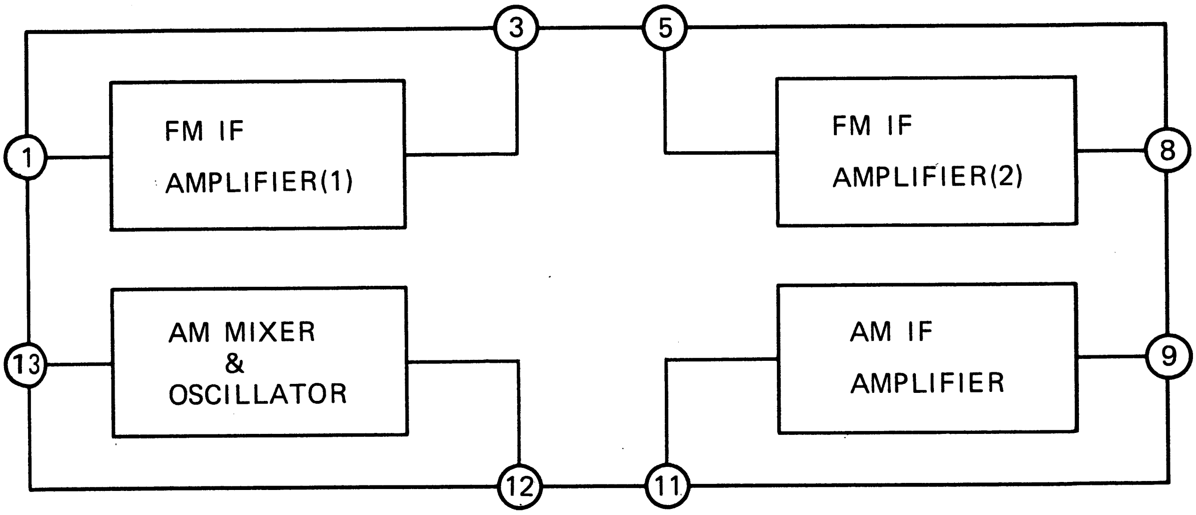


Figure 1. Block Diagram of the AN217

The IC includes an FM IF section and AM Tuner section, each of which comprises two functional blocks. The first block of the FM IF section is an FM IF amplifier (1), the input of which is fed from pin ①, and the output is led to pin ③. The second block is an FM IF amplifier (2), the input of which is fed from pin ⑤ and the output is led to pin ⑧.

The first block of the AM Tuner, on the other hand, is an AM mixer and oscillator, the input of which is fed from pin ⑬ and the output is led to pin ⑫. The second block is an AM IF amplifier, the input of which is fed from pin ⑪ and the output is led to the pin ⑨.

All components except the tuning capacitor and ferrite bar antenna are mounted on the printed circuit board P200.

An AM signal induced in the ferrite bar antenna is led to the base of the RF amplifier transistor (H209) and amplified to a level required for overcoming the conversion noises, thus giving good S/N performance. The tuned circuit inserted in each of the output and input circuits of the RF amplifier assures very high image and spurious rejection performance. Then, the amplified and selected AM signal is fed to one input (pin ⑬) of the Mixer section of the IC(H202) (pin ⑬). While the local oscillator voltage is injected to the other input (pin ⑭) of the section through the capacitor C244. Then, both AM signal and local oscillator signal are mixed and converted into 455kHz intermediate-frequency signal. The resulting IF signal is led to the first IF transformer L205 consisting of one ceramic filter and two tuned circuits.

The output of L205 is led to the additional IF amplifier (H210) for intensifying the AM IF gain. The output, in turn, is led through the coupling capacitor C253 to the input (pin ⑪) of the AM IF section in the IC(H202), where the output is amplifed to a sufficient level to drive the detector. The fully amplified IF output derived from pin ⑨ is applied to the diode H228 to detect audible signal through the detector transformer L206. The detected audio signal is filtered and amplified, and the final audio output is obtained from the collector of H211 and applied to the output jacks through the function switch.

The DC component of the detected IF signal is used as an AGC voltage to control the emitter current of the IF amplifier H210 through the resistor R273 and R271, and then, the emitter voltage derived from transistor H210 controls the collector voltage of the RF amplifier H209.

A part of the IF signal output is also applied to the diode H229 through the capacitor C257 and is rectified to obtain DC current for energizing the AM signal strength meter M001.

2.1 Suggestions for Troubleshooting AM Tuner

Check for broken AM bar antenna, next try to tune a station by rotating the fly-wheel tuning knob slowly and observe the AM signal strength meter whether it deflects or not. If the signal strength meter gives a deflection at several frequencies received, no failure may exist in the stages at least preceding final IF transformer L206. Mext connect an oscilloscope to the test point Ⓐ or J218 and check for audio signals with the tuning meter deflected. If the signal strength meter does not deflect, check the local oscillator circuit. Normal oscillating voltage at the hot end of the oscillator tuning capacitor is about 1.5 or 3 volts, varying with tuning capacitor position. When measuring the oscillating voltage use an RF VTVM, no circuit tester gives correct indication. If the local oscillator voltage is normal, check all voltage distribution in the AM circuits by using a DC VTVM and compare the measured values with those given in the schematic diagram.

3. FM TUNER

The FM tuner section of the Model 112 consists of four functional blocks: FM Front End, IF Amplifier & Detector, Muting Control and MPX Stereo Decoding Circuit.

An FM signal induced by the FM antenna is led to the FM antenna coil L101 through the balun coil. The signal is then fed to the FET RF amplifier, which in turn feed its output to the next Mixer H102 through the double-tuned high-selective circuit. The Mixer converts its input signal into 10.7MHz intermediate-frequency signal and amplifies it at the same time. The H103 is a local oscillator and its output is injected into the base of the Mixer, the injection voltage is about 60mV. The 10.7MHz front end output is led to the next IF amplifier portion through the coaxial cable.

The IF section consists of five IF amplifer stages and one sub IF amplifier stage. The second and third stages of the five-stage IF amplifier, contained in the IC H202, serve as limiter. Three pieces of dual element ceramic filters are also used to obtain high selectivity, two IC limiter stages (H202) and a symmetrical diode limiter are also employed for the best limiting characteristics, improved capture ratio and good AM suppression.

A part of the IF amplifier H201 output is rectified by the diodes H220 and H221 and its DC output is fed back to the gate of the FET RF amplifier to decrease the gain with increase of the signal strength.

The IF signal sufficiently amplified through every IF amplifier stage is finally fed to the detector amplifier. The detected audio output is led to: (a) the Quadradial Jack on the rear panel through the resistor R233 and (b) the MPX stereo decoding IC H215 through R289 and H212.

3.1 Audio Muting and Stereo Mode Auto-Selecting Circuit

The muting circuit consisting of all solid-state electrical switching is incorporated in the Model 112.

The DC voltage obtained by rectifing the sub IF output signal from the H205 is applied to the base of H206 and turns on it, if the sub IF output is greater than predetermined level (muting threshold level).

When the H206 is turned on, the H207 is turned off, allowing the emitter-collector resistance to be increased and the collector voltage to be raised to about 9V. The raised collector voltage increases the gate bias voltage and turns on the switching FET H212, decreasing the sourcedrain resistance to near zero ohm and allowing the audio signal applied to the source to flow to the decoding IC pin ② through the source-drain path.

When the input signal is lower than predetermined level, the DC output obtained is small and can not turn on the H206, thus H206 keeps its turn-off state. This makes H207 turn on, decreasing the collector voltage and turning H212 off. Thus no audio signals can pass through the FET.

The transistor H208 also turns off when the transistor H207 turns on, and makes the transistor H213 turn on, which is connected to pin ⑧ on the MPX decoding IC. Therefore, pin ⑧ is equivalently grounded, and the operation of the IC becomes monaural. This prevents misoperation of stereo due to undesirable noises during deviation of tuning.

3.2 MPX Stereo Decoding Circuit

The stereo composite signal from the FM Detector undergoes phase compensation by R289 amd C255, is led through the muting switching FET H212 to the input terminal pin ② of the MPX stereo decoding IC H215 on PLL (Phase Locked Loop) basis, and is decoded into the left and right stereo signals, which become available at pins ④ and ⑤ respectively. These decoded left and right stereo audio signals are introduced through the low pass filter consisting of L207 to L210 and C273 to C282 for elimination of undesirable residual switching signal and through the de-emphasis network consisting of R308, R309, C283 and C284, into the npn-pnp direct coupled audio amplifier, where the signals are amplified to a required level for the output from J226 and J227. From these jacks, the audio signals are led through the function switch and FM Dolby level preset resistors RS03 and RS04 to the output terminals on the rear panel. Figure 2 presents an internal block diagram showing the functions of the PLL basis MPX stereo decoding IC HA1156.

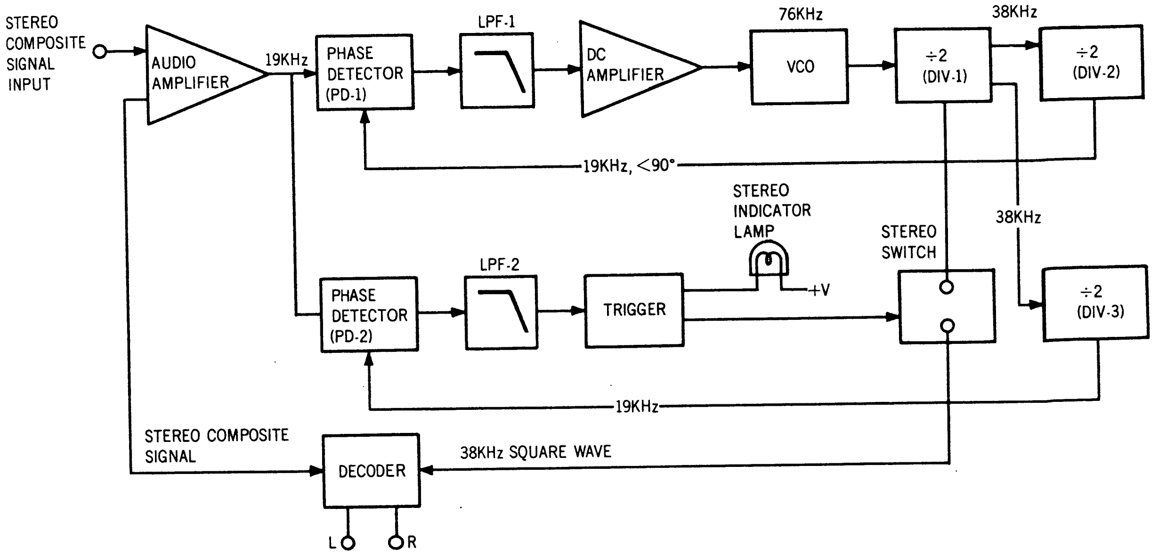

STEREO COMPOSITE SIGNAL INPUT
AUDIO AMPLIFIER
19KHz
PHASE DETECTOR (PD-1)
LPF-1
DC AMPLIFIER
76KHz
VCO
38KHz
÷2 (DIV-1)
÷2 (DIV-2)
19KHz, <90°
STEREO INDICATOR LAMP
+V
STEREO SWITCH
38KHz
LPF-2
PHASE DETECTOR (PD-2)
TRIGGER
÷2 (DIV-3)
19KHz
STEREO COMPOSITE SIGNAL
DECODER
38KHz SQUARE WAVE
L
R
AUDIO OUTPUT

Figure 2. Block Diagram of the HA1156

The input stereo composite signal, amplified by the audio amplifier, is delivered to the phase detectors PD-1 and PD-2. A part of the stereo composite signal is also delivered to the stereo decoder section. The VCO (Voltage Control Oscillator) produces a free run oscillation in the neighborhood of 76kHz with the time constant determined by the capacitor C305 and resistors R311 and R312 set on the outside of pin ⑭. The VCO output has its frequency divided into 19kHz through the two frequency divider stages (DIV-1, DIV-2), and is reverted to the phase detector PD-1, which contains two input terminals designed to produce an output in proportion to the product of the two input signals. The signal led to PD-1 input one is a 19kHz square wave formed through frequency division of the 76kHz VCO output signal by the two frequency divider stages DIV-1 and DIV-2, and the 19kHz pilot signal included in the stereo composite signal as a reference signal is led to the other PD-1 input. Therefore, the output of the PD-1 which has passed through the low pass filter LPF-1 provides DC output voltage in proportion to the phase variance between the two inputs. This DC output voltage is amplified by the DC amplifier, and supplied to the 76kHz VCO as a control voltage. This means that the output frequency and phase of the VCO have been phase-locked to the input pilot signal. The 38kHz sub-carrier reproduced by the PLL as stated above is delivered through the stereo switch to the stereo decoder section as a switching signal, thus driving the decoder stage. One PD-2 input is given the 19kHz resulting from the frequency division completed by the DIV-1 and DIV-3, whereas the other input gets the 19kHz output contained in the composite signal, and the output is provided with a DC output in proportion to the amplitude of the pilot signal. This DC output is furnished through the LPF-2 to the trigger amplifier which drives the stereo indicator lamp and stereo switch. Therefore, insufficient supply of the pilot signal results in failure to light the stereo indicator and to turn on the stereo switch located in the path of the 38kHz switching signal, thereby avoiding a wrong stereo operation. H213 attached on the outside of pin ⑧ is a switching transistor for automatic monaural-stereo switchover. When the intensity of an incoming signal from an FM station is weaker than a predetermined level, this H213 is turned on and pin ⑧ is grounded, thereby developing a condition for monaural reception. For a forced monaural operation, switch the MODE switch to "MONO", and H213 comes into an "On" condition with the positive bias voltage applied to the base, and pin ⑧ is grounded, thereby establishing monaural operation. The transistor H214 connected externally to pin ⑭ is intended to stop the 76kHz oscillation of the VCO which interferes an AM signal during the reception of an AM station. When the function switch is set to "AM" position, a positive bias is charged on the base of H214, H214 is turned on, and pin ⑭ is grounded. Thus, the oscillation of the VCO is stopped, ending the interference with AM reception.

3.3 Suggestion for Troubleshooting FM Tuner

3.3.1 Symptom: No FM Reception

First, turn on the Power switch and try to tune FM stations. Rotate the fly-wheel tuning knob slowly and observe the FM tuning meter. If the tuning meter deflect at several received frequencies, the tuner circuits preceding the discriminator circuit may have no failure. When no reading is obtained in the meter, check the FM local oscillator circuit, using an RF VTVM. The normal local oscillator voltage is one or two volts (rms) at the tuning capacitor, depending on the tuning capacitor position. If the local oscillator voltage is normal, then check all voltage distribution in the FM Front End and IF amplifier unit and compare them with those shown in the circuit diagram. When the tuning meter deflects but no sound is obtained, check the audio circuit, using a high sensitive oscilloscope.

3.3.2 Symptom: No Stereo Separation

First, check that the "MONO" swith is in normal out position. Connect an FM RF signal generator output modulated by a stereo modulator to the rear FM antenna terminals, and check whether the stereo beacon is turned on or not. If not turned on, check for 19kHz VCO output signal (test point Ⓑ, R304), using an oscilloscope and frequency counter.

4. AM ALIGNMENT PROCEDURES

4.1 AM IF Alignment

(1) Connet a sweep generator to J206 and an alignment scope to the test point Ⓑ .

(2) Rotate each core of the IF transformers L205 and L206 for maximum height and flat top symmetrical response.

4.2 AM Frequency Range and Tracking Alignment

(1) Set an AM signal generator of 515kHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end.) and adjust the oscillator coil L204 for maximum audio output.

(2) Set the signal generator to 1650kHz. Place the tuning pointer in the high frequency end and adjust the oscillator trimmer on the oscillator tuning capacitor for maximum audio output.

(3) Repeat Steps (1) and (2) until no further adjustment is necessary.

(4) Set the generator to 600kHz and tune the tuner to the same frequency and adjust the slug core of the AM ferrite rod antenna and RF coil L203 for maximum output.

(5) Set the generator to 1400kHz and tune the tuner to the same frequency and adjust both trimming capacitors of the antenna and RF tuned circuit for maximum output.

(6) Repeat Steps (4) and (5) until no further adjustment is necessary.

Note: During tracking alignment reduce the signal generator output as necessary to avoid AGC action.

5. FM ALIGNMENT PROCEDURES

(1) Connect an FM signal generator (FM SG) to the FM antenna terminals and an oscilloscope and audio distortion analyzer to the output jacks on the rear panel.

(2) Set the FM SG to 87.0MHz and provide about 3 to 5μV. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of the oscillator coil L104 to obtain maximum audio output.

(3) Set the FM SG to 108.5MHz and provide about 3 to 5μV output. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C123 for maximum output.

(4) Repeat Steps (2) and (3) until no further adjustment is necessary.

(5) Set the FM SG to 90MHz and tune the tuner to the same frequency. Decrease signal generator output until the audio output level decreases with decrease of the generator output. Adjust the antenna coil L101, RF coils L102 and L103 and IF transformer L105 for minimum audio distortion.

(6) Set the FM SG to 106MHz and tune the tuner to the same frequency. Adjust the trimming capacitors C101, C102 and C103 for minimum distortion.

(7) Repeat Steps (5) and (6) until no further adjustment is necessary.

(8) Adjust the secondary core (upper) of the discriminator transformer L201 so that the center tuning meter pointer indicates its center at no signal applied. Set the FM SG to 98MHz and increase its output level to 1KμV and tune the tuner to the same frequency so that the center tuning meter pointer indicates its center. Adjust the primary core (lower) of L201 for minimum distortion.

5.1 Stereo Separation Alignment

(1) Set an FM signal generator (FM SG) to provide 1KμV at 98 MHz. Tune the tuner to the same frequency so that the center tuning meter pointer indicates its center. Then turn off the modulation of the FM SG, connect a frequency counter to the test point R304 (point Ⓑ) and adjust R307 so that the frequency counter may precisely read 19kHz.

(2) Modulate the FM SG with the stereo composite signal consisting of either L or R channel (of course, the pilot signal must be included).

(3) Adjust the trimming resistor R289 for maximum and same separation in both channels.

5.2 Muting Circuit Alignment

Set an FM signal generator (FM SG) output to provide 12.5μV (IHF) at 98MHz and tune the receiver to the same frequency.

Adjust the trimming resistor R246 for the threshold level of 12.5μV (during this adjustment turn the MUTING pushswitch "on").

5.3 FM Dolby Level Adjustment

(1) Modulate an FM signal generator to 40% with a 400Hz signal and set it to 98MHz at 1KμV. Precisely tune the tuner to the same frequency.

(2) Depress the FM Dolby pushswitch in. Adjust RS03 and RS04 until the outputs of both channels may become 340mV.

6. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 112 Tuner.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment.
Test Loop		Used with AM Signal generator.
FM Signal Generator	Less than 0.3% distortion.	Signal source for FM alignment.
Stereo Modulator	Less than 0.3% distortion.	Stereo separation alignment and trouble shooting.
Frequency Counter		MPX oscillator Adjustment (VCO).
Audio Oscillator	Weston Model CVO-100P, less than 0.02% residual distortion is required.	Sinewave and squarewaves signal source.
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers.	Waveform analysis and trouble shooting.
VTVM	With AC, DC, RF range.	Voltage measurements.
Circuit Tester		Trouble shooting.

Table 1. Test Equipment Required for Servicing

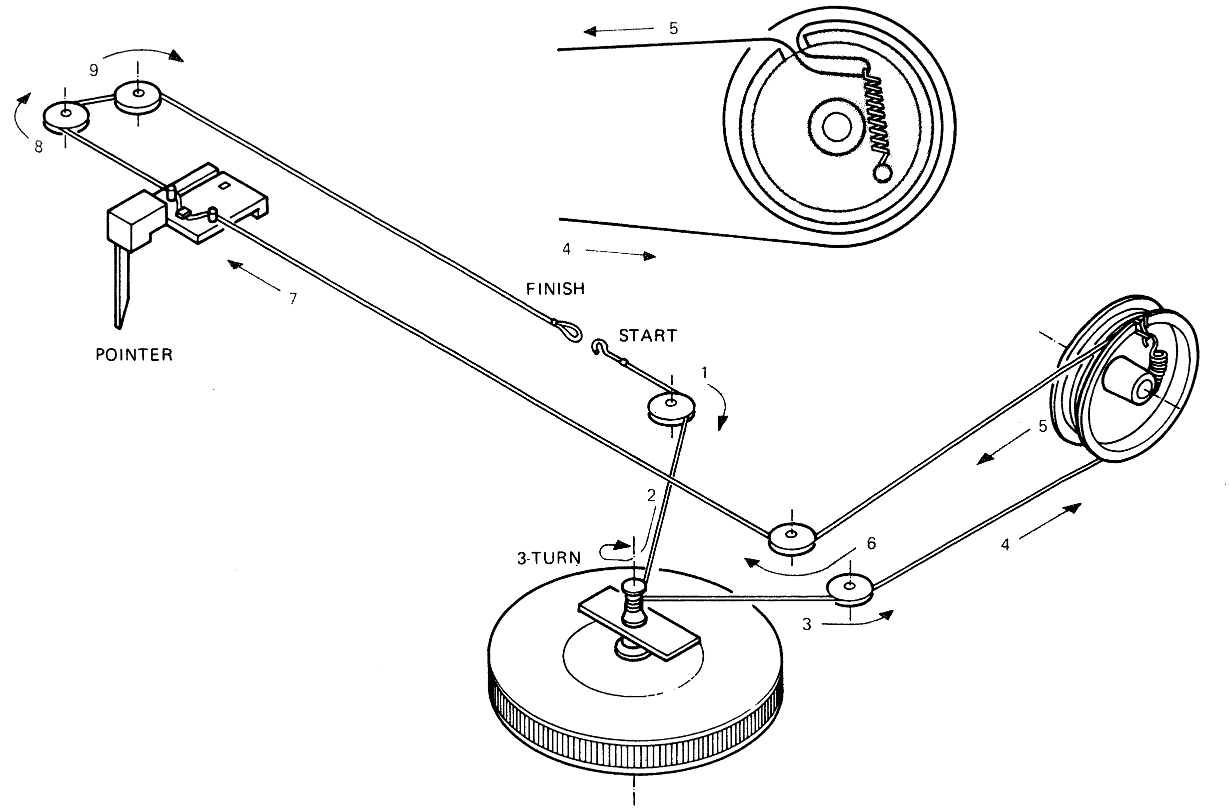

5
9
8
4
FINISH
7
START
POINTER
1
5
2
3-TURN
6
4
3

Figure 3. Dial Stringing

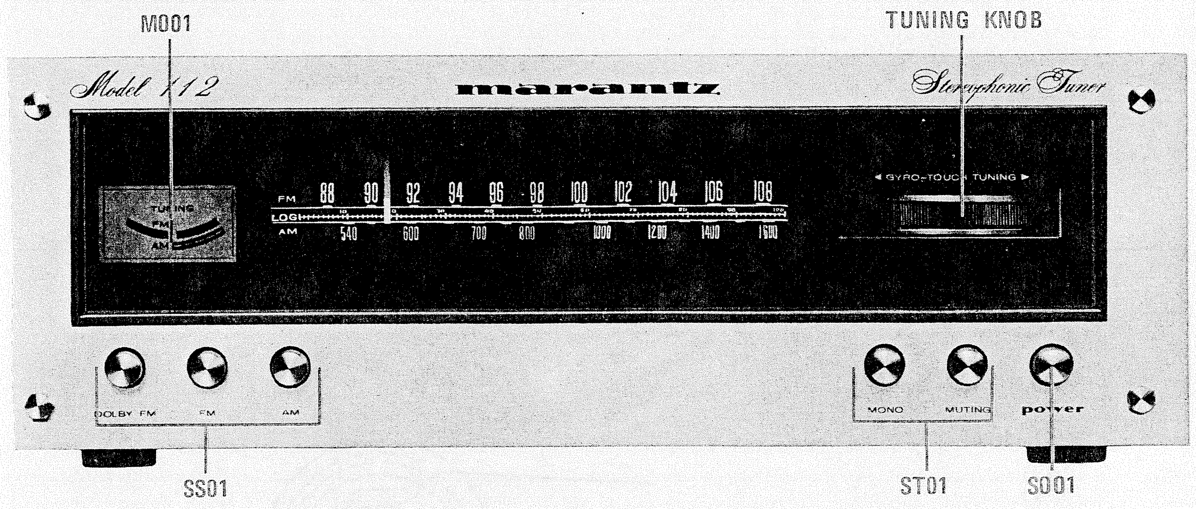

M001
TUNING KNOB
Model 112
marantz
Stereophonic Tuner
FM 88 90 92 94 96 98 100 102 104 106 108
LOG
AM 540 600 700 800 1000 1200 1400 1600
GYRO-TOUCH TUNING
TUNING
DOLBY FM
FM
AM
MONO
MUTING
power
SS01
ST01
S001

Figure 4. Front Panel Adjustment and Component Locations

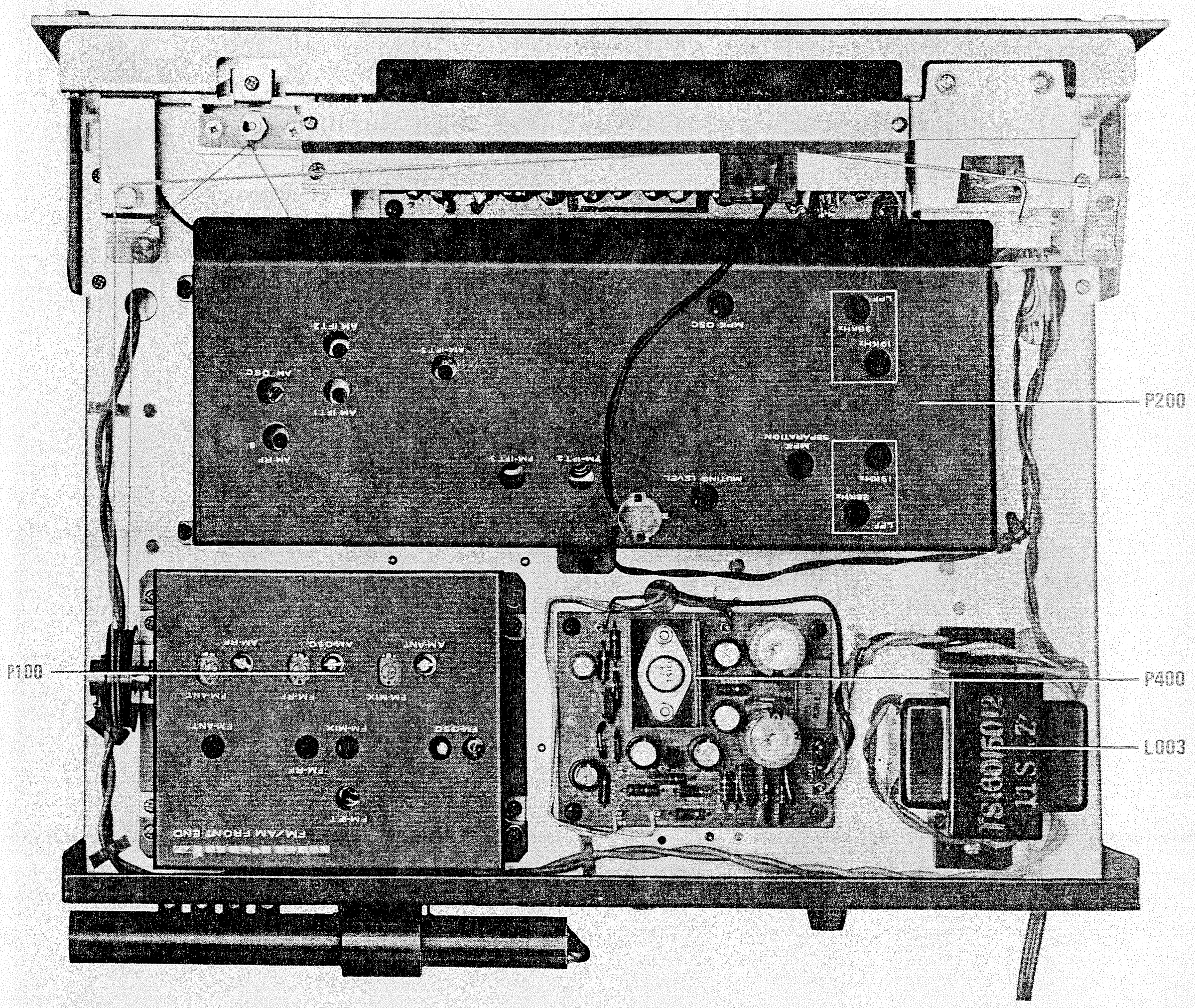

P200
P100
P400
L003
FM/AM FRONT END
TS160F012

Figure 5. Main Chassis Component Locations (Top View)

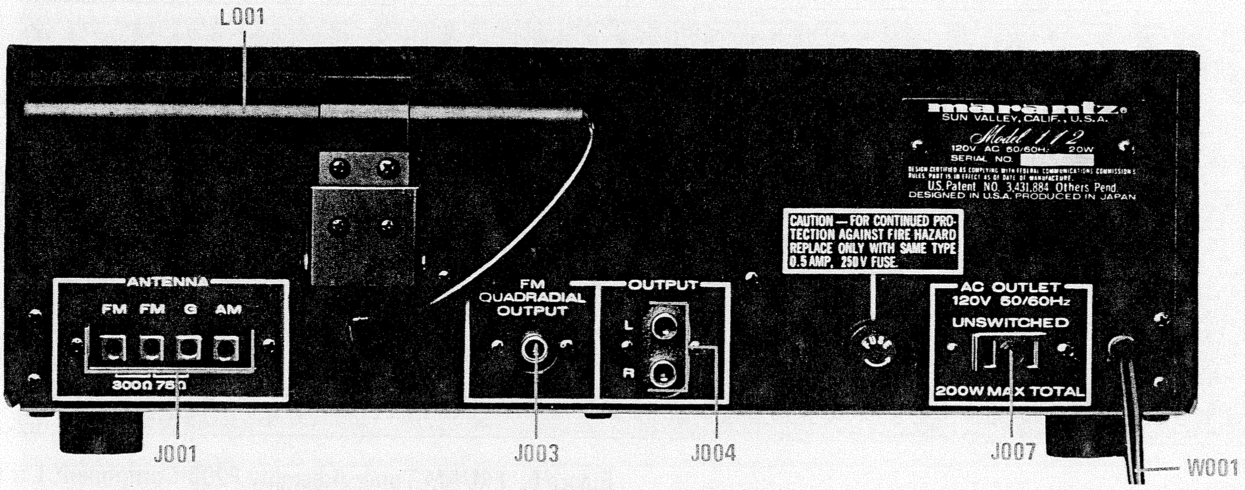

L001
marantz
SUN VALLEY, CALIF., U.S.A.
Model 112
120V AC 50/60Hz 20W
SERIAL NO.
DESIGN CERTIFIED AS COMPLYING WITH FEDERAL COMMUNICATIONS COMMISSION'S RULES, PART 15, IN EFFECT AS OF DATE OF MANUFACTURE.
U.S. Patent NO. 3,431,884 Others Pend.
DESIGNED IN U.S.A. PRODUCED IN JAPAN
CAUTION — FOR CONTINUED PROTECTION AGAINST FIRE HAZARD REPLACE ONLY WITH SAME TYPE 0.5 AMP, 250 V FUSE.
ANTENNA
FM FM G AM
300Ω 75Ω
FM QUADRADIAL OUTPUT
OUTPUT
L
R
FUSE
AC OUTLET
120V 50/60Hz
UNSWITCHED
200W MAX TOTAL
J001
J003
J004
J007
W001

Figure 6. Rear Panel Adjustment and Component Locations

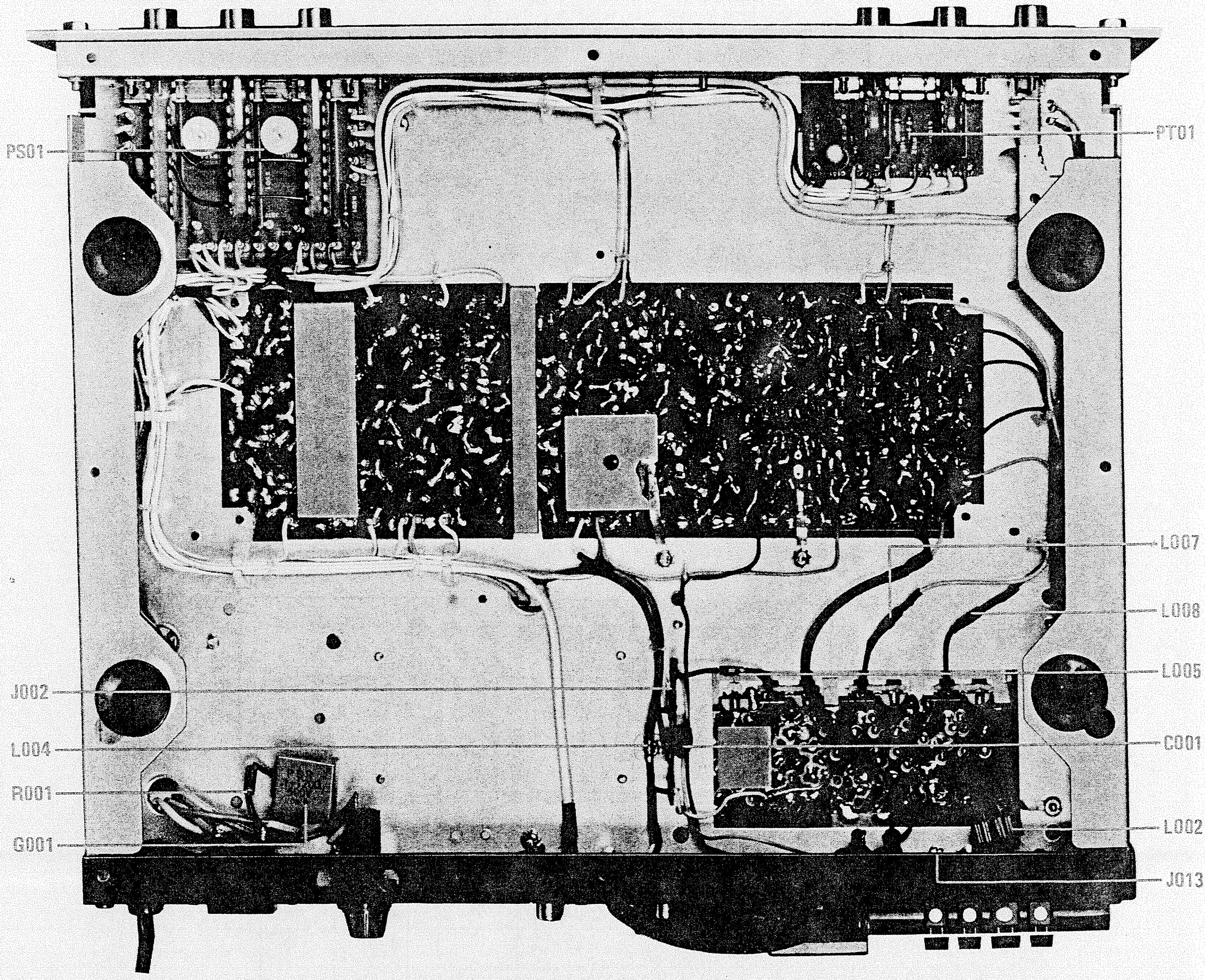

PS01
PT01
L007
L008
L005
C001
L002
J013
J002
L004
R001
G001

Figure 7. Main Chassis Component Locations (Bottom View)

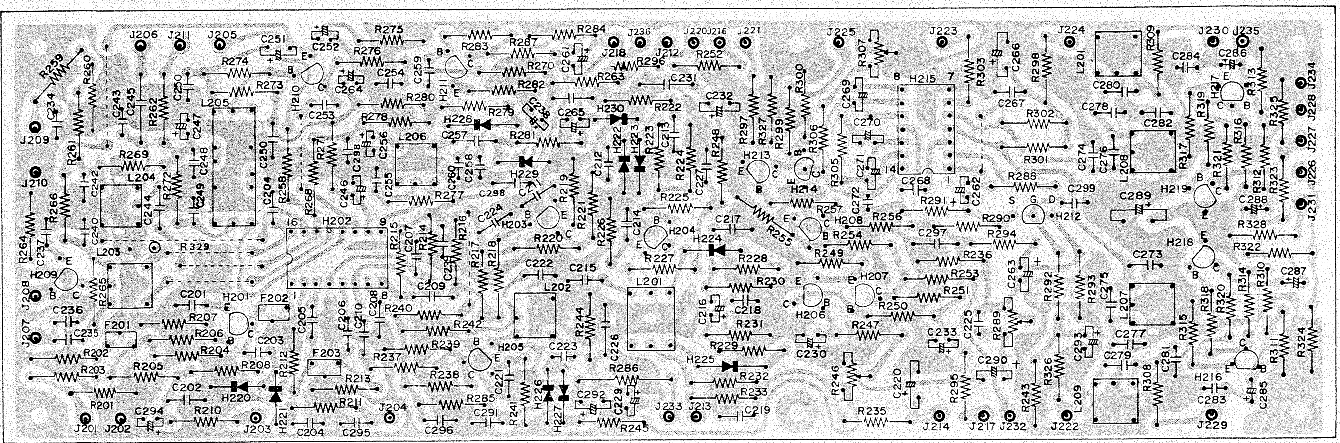


Figure 8. FM/AM Tuner Assembly P200 Component Locations

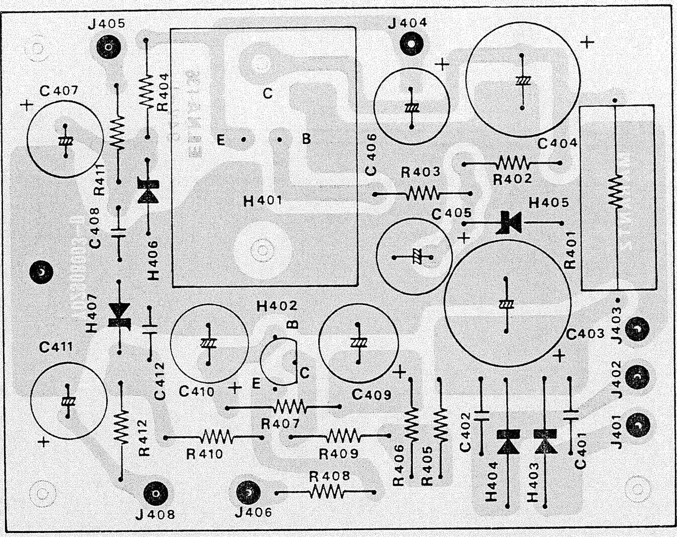

J405
J404
C407
R404
C
E
B
C406
C404
R403
R402
R411
H401
H405
C405
C408
H406
R401
H402
B
H407
C411
C410
E
C
C409
C412
R407
R412
R410
R409
R408
R406
R405
C402
H404
H403
C401
C403
J403
J402
J401
J408
J406

Figure 9. Power Supply Assembly P400 Component Locations

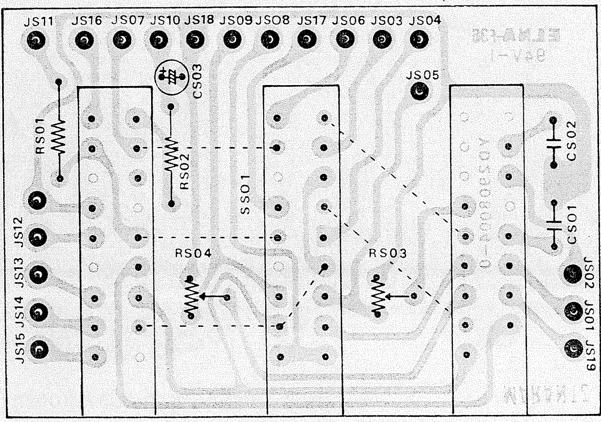

JS11
JS16
JS07
JS10
JS18
JS09
JS08
JS17
JS06
JS03
JS04
CS03
JS05
RS01
RS02
SS01
CS02
CS01
RS04
RS03
JS12
JS13
JS14
JS15
JS02
JS01
JS19

Figure 10. Selector Switch Assembly PS01 Component Locations

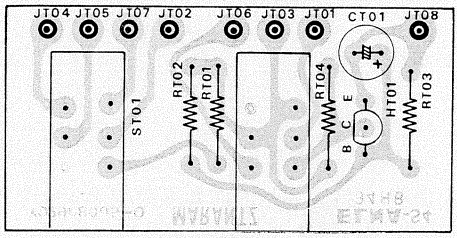

JT04
JT05
JT07
JT02
JT06
JT03
JT01
CT01
JT08
RT02
RT01
ST01
RT04
B
C
E
HT01
RT03

Figure 11. Mode Switch Assembly PT01
Component Locations

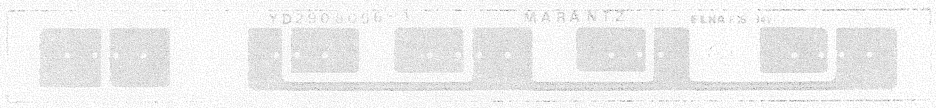


Figure 12. Function Lamp Assembly PY01 Component Locations

ELNA-F36 94V-1

Figure 13. Dial Lamp Assembly PZ01 Component Locations

NOTE

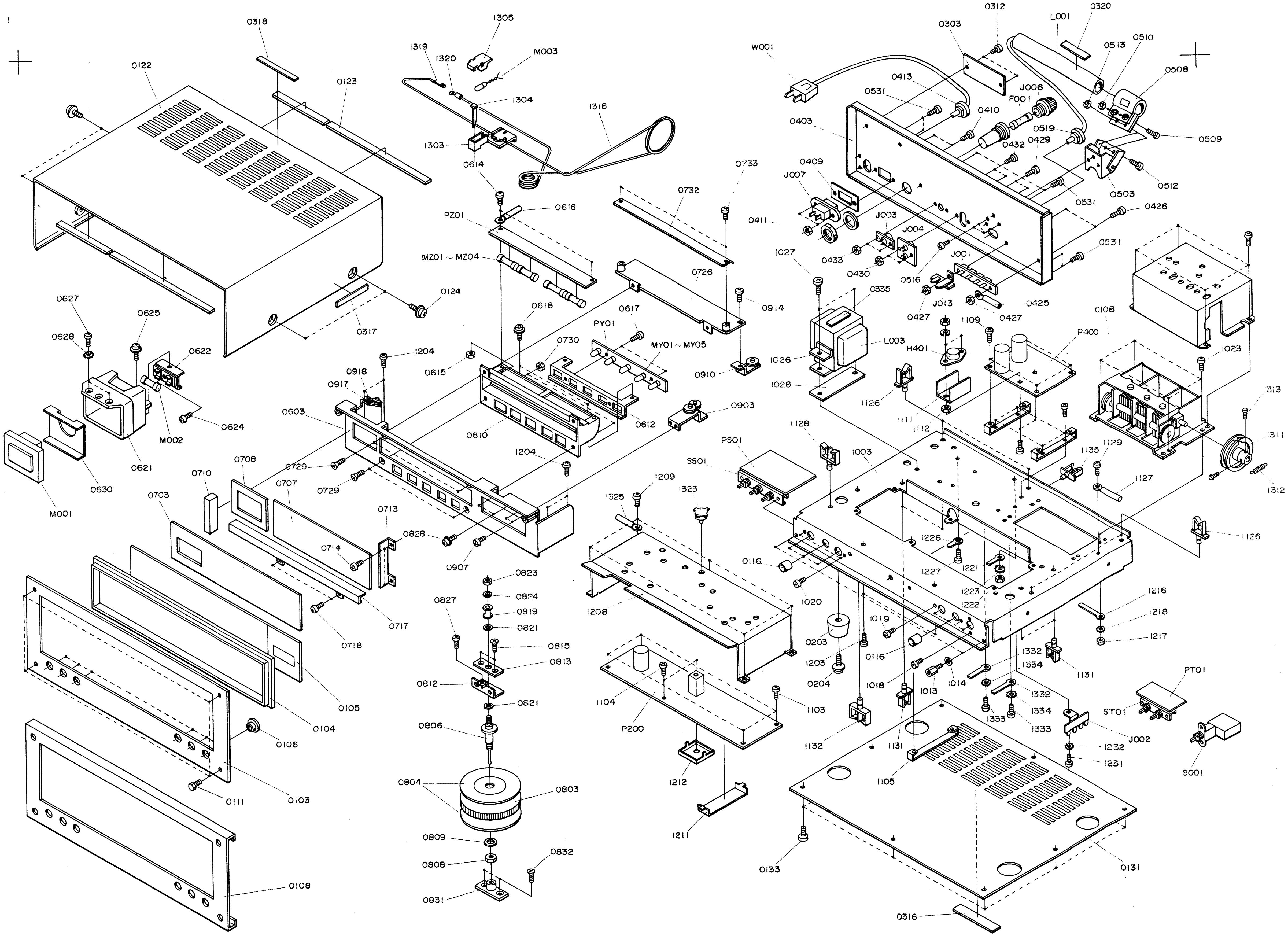
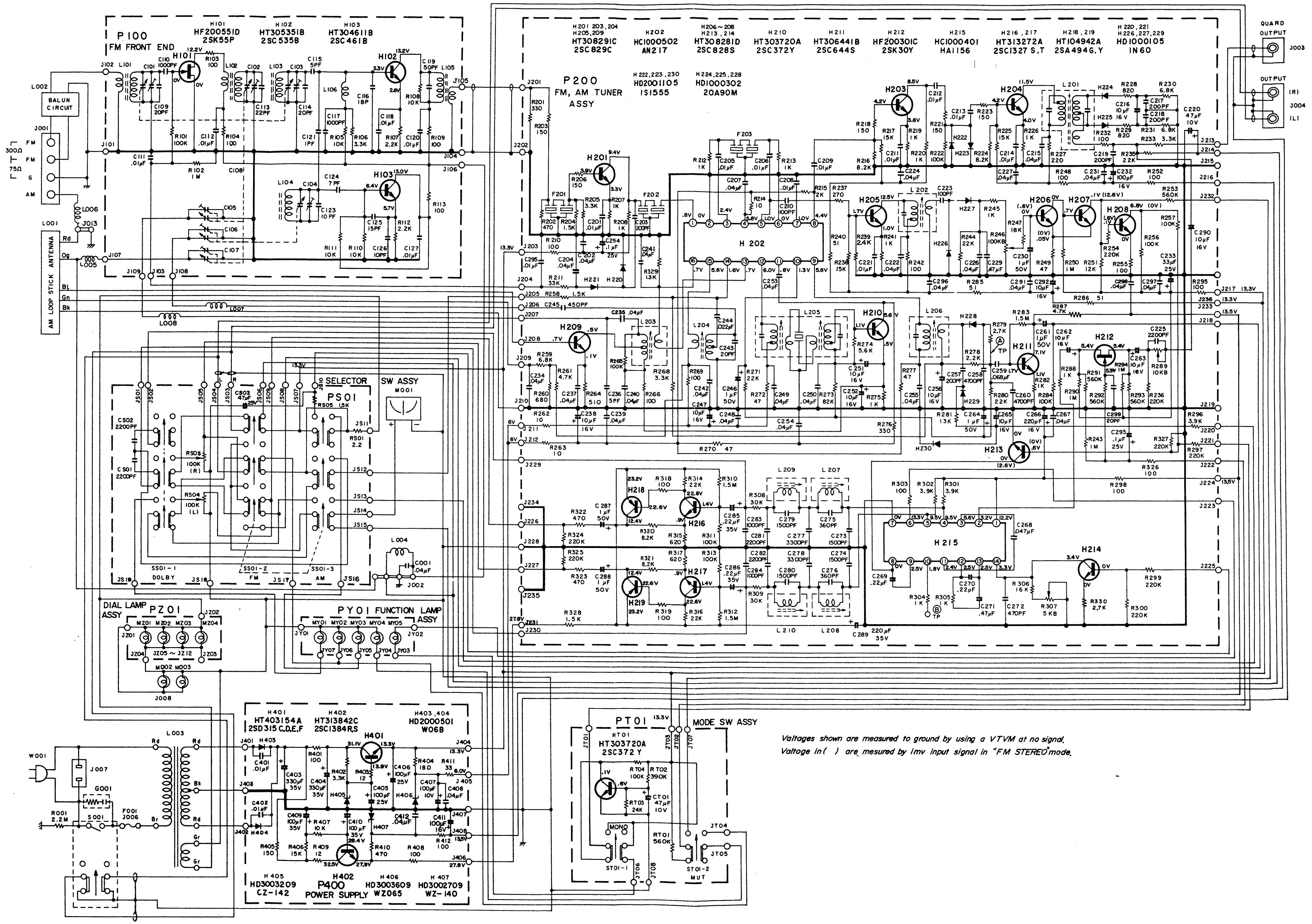

0318
1305
1319
1320
M003
1304
1318
1303
0614
0616
PZ01
MZ01 ~ MZ04
0122
0123
0124
0317
0618
0617
PY01
MY01 ~ MY05
0730
0612
0615
1204
0918
0917
0603
0610
0729
0733
0732
0726
0914
0910
0903
0627
0625
0628
0622
0624
M002
0621
0630
M001
0710
0708
0707
0703
0713
0714
0717
0718
0828
0907
0105
0104
0106
0103
0111
0108
0823
0824
0819
0821
0827
0815
0813
0812
0806
0804
0803
0809
0808
0832
0831
W001
0312
L001
0320
0303
0513
0510
0508
0413
J006
F001
0531
0403
0410
0519
0509
0432
0429
0409
J007
0411
J003
J004
0433
0430
0516
J001
0503
0512
0426
0425
0427
J013
1027
0335
L003
1026
1028
1109
H401
P400
C108
1023
1313
1311
1312
1126
1111
1112
1128
1129
1135
1127
PS01
SS01
1003
1209
1325
1323
1226
1221
1227
1223
1222
0116
1020
1019
1208
0203
1203
0204
1018
1013
1014
1216
1218
1217
1332
1334
1131
1333
PT01
ST01
J002
1232
1231
S001
1104
P200
1103
1132
1105
1212
1211
0133
0131
0316

Figure 14. Exploded Mechanical Diagram


P100
FM FRONT END
H101 HF2005ID 2SK55P
H102 HT305351B 2SC535B
H103 HT304611B 2SC461B
BALUN CIRCUIT
300Ω FM
75Ω FM
G
AM
AM LOOP STICK ANTENNA
P200
FM, AM TUNER ASSY
H201 203, 204 H205, 209 HT308291C 2SC829C
H202 HC1000502 AN217
H206~208 H213, 214 HT308281D 2SC828S
H210 HT303720A 2SC372Y
H211 HT306441B 2SC644S
H212 HF200301C 2SK30Y
H215 HC1000401 HA1156
H216, 217 HT313272A 2SC1327 S,T
H218, 219 HT104942A 2SA494G,Y
H220, 221 H226, 227, 229 HD1000105 IN60
H222, 223, 230 HD2001105 1S1555
H224, 225, 228 HD1000302 20A90M
H202
H215
QUARD OUTPUT
J003
OUTPUT
(R) J004 (L)
SELECTOR SW ASSY
PS01
M001
DOLBY
FM
AM
DIAL LAMP ASSY
PZ01
PY01 FUNCTION LAMP ASSY
J008
PT01
MODE SW ASSY
HT01 HT303720A 2SC372Y
MONO
ST01-1
ST01-2 MUT
H401 HT403154A 2SD315C,D,E,F
H402 HT313842C 2SC1384R,S
H403, 404 HD2000501 W06B
H405 HD3003209 CZ-142
H406 HD3003609 WZ065
H407 HD3002709 WZ-140
P400 POWER SUPPLY
W001
L003
S001
F001
R001 2.2M
G001
J007

Voltages shown are measured to ground by using a VTVM at no signal.
Valtoge in( ) are mesured by Imv input signal in "FM STEREO" mode.

Figure 15. Schematic Diagram

7. PARTS LIST

REF. DESIG.	U	E	PART NO.	DESCRIPTION
A	1	1	290806340	Front Panel Assembly
0103	1	1	290806301	Escutcheon
0104	1	1	291240101	Frame
0105	1	1	290815801	Window
0106	6	6	288625901	Bush
0108	1	1	290805301	Cover
B	1	1	282725740	Lid Assembly, Top
0122	1	1	282725701	Lid
0123	3	3	257711807	Spacer
C		1	290816040	Rear Panel Assembly
0405		1	290816022	Bracket
0416		1	282125901	Bush
0417		2	55060305S	T R Rivet
D	1	1	290810340	Pointer Assembly
1303	1	1	290810301	Pointer
1304	1	1	290810302	Pointer
1305	1	1	290806701	Cap
M003	1	1	IN1008030	Lamp
E	1	1	282715942	Drum Assembly
1311	1	1	282715901	Drum
1312	1	1	71101569M	Spring
1313	2	2	51064019A	Screw
F	1	1	120200640	Hook Assembly
1318	1	1	72080802A	String
1319	1	1	120225801	Hook
G	1	1	290827340	Fly Wheel Assembly
0803	1	1	257727301	Fly Wheel
0804	2	2	257706302	Escutcheon
0806	1	1	290811201	Shaft
0808	1	1	53110603E	Hexagon Nut
0809	1	1	54020601E	Flat Washer
				FM/AM TUNER CIRCUIT BOARD-P200
P200	1	1	YD2908002	P.W. Board, FM/AM Tuner (Print Only)
	1		ZZ2908002	P.W. Board Assembly
		1	ZZ2908802	P.W. Board Assembly
				P200-RESISTORS **All resistors are ±5% and ¼W, unless otherwise indicated.**
R201	1	1	RT0533114	330Ω
R202	1	1	RT0547114	470Ω
R203	1	1	RT0515114	150Ω
R204	1	1	RT0515214	1.5KΩ
R205	1	1	RT0533214	3.3KΩ
R206	1	1	RT0515114	150Ω
R207	1	1	RT0510214	1KΩ
R208	1	1	RT0510214	1KΩ
R210	1	1	RT0510114	100Ω
R211	1	1	RT0533314	33KΩ
R212	1	1	RT0510214	1KΩ
R213	1	1	RT0510214	1KΩ

REF. DESIG.	U	E	PART NO.	DESCRIPTION
R214	1	1	RT0510014	10Ω
R215	1	1	RT0520214	2KΩ
R216	1	1	RT0582214	8.2KΩ
R217	1	1	RT0515314	15KΩ
R218	1	1	RT0515114	150Ω
R219	1	1	RT0510214	1KΩ
R220	1	1	RT0510214	1KΩ
R221	1	1	RT0515114	150Ω
R222	1	1	RT0510414	100KΩ
R223	1	1	RT0515114	150Ω
R224	1	1	RT0582214	8.2KΩ
R225	1	1	RT0515314	15KΩ
R226	1	1	RT0510214	1KΩ
R227	1	1	RT0522114	220Ω
R228	1	1	RT0582114	820Ω
R229	1	1	RT0582114	820Ω
R230	1	1	RT0568214	6.8KΩ
R231	1	1	RT0568214	6.8KΩ
R232	1	1	RT0510114	100Ω
R233	1	1	RT0533214	3.3KΩ
R235	1	1	RT0522314	22KΩ
R236	1	1	RT0522414	220KΩ
R237	1	1	RT0527114	270Ω
R238	1	1	RT0515314	15KΩ
R239	1	1	RT0582214	8.2KΩ
R240	1	1	RT0551014	51Ω
R241	1	1	RT0510214	1KΩ
R242	1	1	RT0510114	100Ω
R243	1	1	RT0510514	1MΩ
R244	1	1	RT0522314	22KΩ
R245	1	1	RT0510214	1KΩ
R246	1	1	RA0104018	Trimming, .100KΩ (B)
R247	1	1	RT0518314	18KΩ
R248	1	1	RT0510114	100 Ω
R249	1	1	RT0547014	47Ω
R250	1	1	RT0510514	1MΩ
R251	1	1	RT0512314	12KΩ
R252	1	1	RT0510114	100Ω
R253	1	1	RT0556414	560KΩ
R254	1	1	RT0522414	220KΩ
R255	1	1	RT0510114	100Ω
R256	1	1	RT0510414	100KΩ
R257	1	1	RT0510414	100KΩ
R258	1	1	RT0515214	1.5KΩ
R259	1	1	RT0568214	6.8KΩ
R260	1	1	RT0568114	680Ω
R261	1	1	RT0547214	4.7KΩ
R262	1	1	RT0510014	10Ω
R263	1	1	RT0510014	10Ω
R264	1	1	RT0551114	510Ω
R265	1	1	RT0510414	100KΩ
R266	1	1	RT0510114	100Ω
R267	1	1	RT0510214	1KΩ
R268	1	1	RT0533214	33KΩ
R269	1	1	RT0510114	100Ω
R270	1	1	RT0547014	47Ω
R271	1	1	RT0522314	22KΩ
R272	1	1	RT0547014	47Ω
R273	1	1	RT0582314	82KΩ
R274	1	1	RT0556214	5.6KΩ
R275	1	1	RT0510214	1KΩ

REF. DESIG.	U	E	PART NO.	DESCRIPTION
R276	1	1	RT0533114	330Ω
R277	1	1	RT0547014	47Ω
R278	1	1	RT0522214	2.2KΩ
R279	1	1	RT0527214	2.7KΩ
R280	1	1	RT0522314	22KΩ
R281	1	1	RT0513314	13KΩ
R282	1	1	RT0510214	1KΩ
R283	1	1	RT0515514	1.5MΩ
R284	1	1	RT0510414	100KΩ
R285	1	1	RT0551014	51Ω
R286	1	1	RT0551014	51Ω
R287	1	1	RT0547214	4.7KΩ
R288	1	1	RT0510214	1KΩ
R289	1	1	RA0103025	Trimming, 10KΩ (B)
R290	1	1	RT0510514	1MΩ
R291	1	1	RT0556414	560KΩ
R292	1	1	RT0556414	560KΩ
R293	1	1	RT0556414	560KΩ
R294	1	1	RT0510514	1MΩ
R295	1	1	RT0510114	100Ω
R296	1	1	RT0539214	3.9KΩ
R297	1	1	RT0522414	220KΩ
R298	1	1	RT0510114	100Ω
R299	1	1	RT0522414	220KΩ
R300	1	1	RT0522414	220KΩ
R301	1	1	RT0539214	3.9KΩ
R302	1	1	RT0539214	3.9KΩ
R303	1	1	RC1010112	100Ω ±10%, ½W
R304	1	1	RT0510214	1KΩ
R305	1	1	RT0510214	1KΩ
R306	1	1	RT0516314	16KΩ
R307	1	1	RA0502020	Trimming, 5KΩ (B)
R308	1	1	RT0530314	30KΩ
R309	1	1	RT0530314	30KΩ
R310	1	1	RT0515514	1.5MΩ
R311	1	1	RT0510414	100KΩ
R312	1	1	RT0515514	1.5MΩ
R313	1	1	RT0510414	100K Ω
R314	1	1	RT0522314	22KΩ
R315	1	1	RT0562114	620 Ω
R316	1	1	RT0522314	22KΩ
R317	1	1	RT0562114	620Ω
R318	1	1	RT0510114	100Ω
R319	1	1	RT0510114	100Ω
R320	1	1	RT0582214	8.2KΩ
R321	1	1	RT0582214	8.2KΩ
R322	1	1	RT0547114	470Ω
R323	1	1	RT0547114	470Ω
R324	1	1	RT0522414	220KΩ
R325	1	1	RT0522414	220KΩ
R326	1	1	RT0510114	100Ω
R327	1	1	RT0522414	220KΩ
R328	1	1	RT0515214	1.5KΩ
R329	1	1	RT0510214	1KΩ
R330	1	1	RT0527214	2.7KΩ
				P200-SEMICONDUCTORS
H201	1	1	HT308291C	Transistor, 2SC829(C)
H202	1	1	HC1000502	IC, AN217
H203	1	1	HT308291C	Transistor, 2SC829(C)
H204	1	1	HT308291C	Transistor, 2SC829(C)

REF. DESIG.	U	E	PART NO.	DESCRIPTION
H205	1	1	HT308291C	Transistor, 2SC829(C)
H206	1	1	HT308281D	Transistor, 2SC828(S)
H207	1	1	HT308281D	Transistor, 2SC828(S)
H208	1	1	HT308281D	Transistor, 2SC828(S)
H209	1	1	HT308291C	Transistor, 2SC829(C)
H210	1	1	HT303720A	Transistor, 2SC372(Y)
H211	1	1	HT306441B	Transistor, 2SC644 (S)
H212	1	1	HF200301C	FET, 2SK30 (Y)
H213	1	1	HT308281D	Transistor, 2SC828 (S)
H214	1	1	HT308281D	Transistor, 2SC828 (S)
H215	1	1	HC1000401	IC, HA1156
H216	1	1	HT313272A	Transistor, 2SC1327S orT
H217	1	1	HT313272A	Transistor, 2SC1327S or T
H218	1	1	HT104942A	Transistor, 2SA494 G or Y
H219	1	1	HT104942A	Transistor, 2SA494 G or Y
H220	1	1	HD1000105	Diode, IN60
H221	1	1	HD1000105	Diode, IN60
H222	1	1	HD2001105	Diode, IS1555
H223	1	1	HD2001105	Diode, IS1555
H224	1	1	HD1000302	Diode, 20A90M
H225	1	1	HD1000302	Diode, 20A90M
H226	1	1	HD1000105	Diode, IN60
H227	1	1	HD1000105	Diode, IN60
H228	1	1	HD1000302	Diode, 20A90M
H229	1	1	HD1000105	Diode, IN60
H230	1	1	HD2001105	Diode, IS1555
				P200-CAPACITORS
C201	1	1	DK1710301	Ceramic, 0.01μF ±20%
C202	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C203	1	1	DD1620101	Ceramic, 200PF ±10%SL
C204	1	1	DK1710301	Ceramic, 0.01μF ±20%
C205	1	1	DK1710301	Ceramic, 0.01μF ±20%
C206	1	1	DK1710301	Ceramic, 0.01μF ±20%
C207	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C208	1	1	DK1710301	Ceramic, 0.01μF ±20%
C209	1	1	DK1710301	Ceramic, 0.01μF ±20%
C210	1	1	DD1610101	Ceramic, 100PF ±10% SL
C211	1	1	DK1710301	Ceramic, 0.01μF ±20%
C212	1	1	DK1710301	Ceramic, 0.01μF ±20%
C213	1	1	DK1710301	Ceramic 0.01μF ±20%
C214	1	1	DK1710301	Ceramic 0.01μF ±20%
C215	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C216	1	1	EA1060169	Electroly, 10μF, 16V
C217	1	1	DD1620101	Ceramic, 200PF ±10%
C218	1	1	DD1620101	Ceramic, 200PF ± 10%
C219	1	1	DD1620101	Ceramic, 200PF ±10%
C220	1	1	EA4760109	Electroly, 47μF 10V
C221	1	1	DK1710301	Ceramic, 0.01μF ±20%
C222	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C223	1	1	DD1610101	Ceramic, 100PF ±10%
C224	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C225	1	1	DF1722201	Film, 2200PF ±20%
C226	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C227	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C229	1	1	EA4740509	Electroly, 0.47μF, 50V
C230	1	1	EA1050509	Electroly, 1μF, 50V
C231	1	1	DK1840301	Ceramic, 0.04μF +100%,–0%
C232	1	1	EA1070169	Electroly, 100μF, 16V
C233	1	1	EA3360259	Electroly, 33μF, 25V
C234	1	1	DF1740301	Film 0.04μF ±20%
C235	1	1	DF1740301	Film, 0.04μF ±20%

REF. DESIG.	U	E	PART NO.	DESCRIPTION
C236	1	1	DD1105001	Ceramic, 5PF ±0.5PF
C237	1	1	DF1740301	Film, 0.04µF ±20%
C238	1	1	EA1060169	Electroly, 10µF, 16V
C239	1	1	DF1740301	Film, 0.04µF ±20%
C240	1	1	DF1740301	Film, 0.04µF ±20%
C241	1	1	DF1740301	Film, 0.04µF ±20%
C242	1	1	DF1740301	Film, 0.04µF ±20%
C243	1	1	DD1620001	Ceramic, 20PF ±10%
C244	1	1	DF1722301	Film, 0.022µF ±20%
C245	1	1	DF6545101	Film, 450PF ±5%
C246	1	1	EA1050509	Electroly, 1µF, 50V
C247	1	1	EA1060169	Electroly, 10µF, 16V
C248	1	1	DF1740301	Film, 0.04µF ±20%
C249	1	1	DF1740301	Film, 0.04µF ±20%
C250	1	1	DF1740301	Film, 0.04µF ±20%
C251	1	1	EA1060169	Electroly, 10µF, 16V
C252	1	1	EA1060169	Electroly, 10µF, 16V
C253	1	1	DF1740301	Film, 0.04µF ±20%
C254	1	1	DF1740301	Film, 0.04µF ±20%
C255	1	1	DF1740301	Film, 0.04µF ±20%
C256	1	1	EA1060169	Electroly, 10µF, 16V
C257	1	1	DD1620101	Ceramic, 200PF ±10% SL
C258	1	1	DF1747201	Film, 4700PF ±20%
C259	1	1	DF1668301	Film, 0.068µF ±10%
C260	1	1	DF1747201	Film, 4700PF ±20%
C261	1	1	EA1060169	Electroly, 10µF, 16V
C262	1	1	EA1060169	Electroly, 10µF, 16V
C263	1	1	EA1060169	Electroly, 10µF, 16V
C264	1	1	EA1050509	Electroly, 1µF, 50V
C265	1	1	EA1060169	Film, 10µF, 16V
C266	1	1	EA2270169	Electroly, 220µF 16V
C267	1	1	DK1840301	Ceramic, 0.04µF +100%,–0%
C268	1	1	DF1747301	Film, 0.047µF ±20%
C269	1	1	EQ2240501	Electroly, 0.22µF ±20%
C270	1	1	EQ2240501	Electroly, 0.22µF ±20%
C271	1	1	EQ4740501	Electroly, 0.47µF ±20%
C272	1	1	DF5547101	Film, 470PF ±5%
C273	1	1	DF1615205	Film, 1500PF ±10%
C274	1	1	DF1615205	Film, 1500PF ±10%
C275	1	1	DD1536101	Ceramic, 360PF ±5%
C276	1	1	DD1536101	Ceramic, 360PF ±5%
C277	1	1	DF1633205	Film, 3300PF ±10%
C278	1	1	DF1633205	Film, 3300PF ±10%
C279	1	1	DF1515205	Film, 1500PF ±5%
C280	1	1	DF1515205	Film, 1500PF ±5%
C281	1	1	DF1622205	Film, 2200PF ±10%
C282	1	1	DF1622205	Film, 2200PF ±10%
C283	1	1	DF1510205	Film, 1000PF ±5%
C284	1	1	DF1510205	Film, 1000PF ±5%
C285	1	1	EV2240351	Electroly, 0.22µF ±20%, 35V
C286	1	1	EV2240351	Electroly, 0.22µF ±20%, 35V
C287	1	1	EA1050509	Electroly, 1µF, 50V
C288	1	1	EA1050509	Electroly, 1µF, 50V
C289	1	1	EA2270359	Electroly, 220µF, 35V
C290	1	1	EA1060169	Electroly, 10µF, 16V
C291	1	1	DK1840301	Ceramic, 0.04µF +100%,–0%
C292	1	1	EA1060169	Electroly, 10µF, 16V
C293	1	1	EV1040251	Electroly, 0.1µF, 25V
C294	1	1	EA1060169	Electroly, 10µF, 16V
C295	1	1	DK1710301	Ceramic, 0.01µF ±20%
C296	1	1	DK1840301	Ceramic, 0.04µF +100%,–0%

REF. DESIG.	U	E	PART NO.	DESCRIPTION
C297	1	1	DK1840301	Ceramic, 0.04µF +100%,–0%
C298	1	1	DK1840301	Ceramic, 0.04µF +100%,–0%
C299	1	1	DD1620001	Ceramic, 20PF ±10%
				P200-MISCELLANEOUS
F201	1	1	FF1107052	Ceramic Filter, CFS 10.7M
F202	1	1	FF1107052	Ceramic Filter, CFS 10.7M
F203	1	1	FF1107052	Ceramic Filter, CFS 10.7M
L201	1	1	LI1401623	IFT, FM
L202	1	1	LI1015602	IFT, FM
L203	1	1	LA1001017	Coil, AM RF
L204	1	1	LO1001042	Coil, AM OSC
L205	1		LI1028002	IFT, AM
L206	1	1	LI1001048	IFT, AM
L207	1	1	LS1029004	MPX Coil, 56mH
L208	1	1	LS1029004	MPX Coil, 56mH
L209	1	1	LS1029005	MPX Coil, 43mH
L210	1	1	LS1029005	MPX Coil, 43mH
L205		1	LI1028003	IFT, AM
1211	1	1	290810903	Shield
1212	1	1	290810902	Shield
J201 ≀ J235	1	1	YP1000113	Plug
				GENERAL MISCELLANEOUS
L007	1	1	LC1332002	Choke Coil
L008	1	1	LC1332002	Choke Coil
				POWER SUPPLY CIRCUIT BOARD -P400
P400	1	1	YD2908003	P. W. Board, Power Supply (Print Only)
	1	1	ZZ2908003	P. W. Board Assembly
				P400-RESISTORS
R401	1	1	GS1010105	100Ω ±10%, 5W
R402	1	1	RC1033212	3.3KΩ ±10%, ½W
R403	1	1	RC1012012	12Ω ±10%, ½W
R404	1	1	RC1018112	180Ω ±10%, ½W
R405	1	1	RC1015112	150Ω ±10%, ½W
R406	1	1	RC1015312	15KΩ ±10%, ½W
R407	1	1	RC1010312	10KΩ ±10%, ½W
R408	1	1	RC1010112	100Ω ±10%, ½W
R409	1	1	RC1012012	12Ω ±10%, ½W
R410	1	1	RC1047112	470Ω ±10%, ½W
R412	1	1	RC1010112	100Ω ±10%, ½W
R411	1	1	RC1033012	33Ω ±10%, ½W
				P400-CAPACITORS
C401	1	1	DK1810351	Ceramic, 0.01µF +100%,–0%,50V
C402	1	1	DK1810351	Ceramic, 0.01µF +100%,–0%,50V
C403	1	1	EA3370509	Electroly, 330µF, 50V
C404	1	1	EA3370509	Electroly, 330µF, 50V
C405	1	1	EA1070259	Electroly, 100µF, 25V
C406	1	1	EA1070259	Electroly, 100µF, 25V
C407	1	1	EA1070109	Electroly, 100µF, 10V
C408	1	1	DK1840301	Ceramic, 0.04µF +100%,–0%,
C409	1	1	EA1070359	Electroly, 100µF, 35V
C410	1	1	EA1070359	Electroly, 100µF, 35V
C411	1	1	EA1070169	Electroly, 100µF, 16V

REF. DESIG.	U	E	PART NO.	DESCRIPTION
C412	1	1	DK1840301	Cramic, 0.04μF +100%,–0%
				P400-SEMICONDUCTORS
H401	1	1	HT403154A	Transistor, 2SD315 (C,D,E,F)
H402	1	1	HT313842C	Transistor, 2SC1384 R or S
H403	1	1	HD2000501	Diode, W 06B
H404	1	1	HD2000501	Diode, W 06B
H405	1	1	HD3003209	Diode, CZ-142
H406	1	1	HD3003609	Diode, WZ065
H407	1	1	HD3002709	Diode, WZ-140
				P400-MISCELLANEOUS
J401 ≀ J408	1	1	YP1000113	Plug
1111	1	1	273026702	Heat Sink, Power Transistor
1112	2	2	53110303E	Hexagon Nut
				GENERAL MISCELLANEOUS
0603	1	1	290816050	Bracket K
0621	1	1	285427401	Reflector
0625	1	1	51480306A	B. H. M. Screw F
0627	2	2	51570306B	P. H. Tapt Screw P 3 x 6 ST
0628	2	2	54050300R	T. L. Washer OR
0708	1	1	287105302	Cover
0713	1	1	290820101	Partitioner
0714	2	2	51570306B	P. H. Tapt Screw P 3 x 6 ST
0726	1	1	290805150	Guide K
0729	4	4	51042606A	F. H. M. Screw F 2.6 x 6
0730	2	2	53112603A	Hexagon Nut
0903	1	1	290826250	Pulley K
0907	2	2	51100306A	B. H. M. Screw B 3 x 6
0917	2	2	127126201	Pulley
0918	2	2	263711203	Shaft
0610	1	1	290827401	Reflector
0612	1	1	290827101	Holder
0614	2	2	51100308S	B. H. M. Screw B 3 x 8
0615	2	2	53110303A	Hexagon Nut
0617	2	2	51570306B	P. H. Tapt Screw P 3x6 ST
0618	2	2	51480306A	B. H. M. Screw F
				DIAL LAMP BOARD-PZ01
PZ01	1	1	YD2908007	P.W. Board, Dial Lamp (Print Only)
	1	1	ZZ2908007	P. W. Board Assembly
				PZ01-MISCELLANEOUS
MZ01 ≀ MZ04	1	1	IN1008007	Lamp, Dial Illumination
JZ01 ≀ JZ04	1	1	YP1000113	Plug
JZ05 ≀ JZ12	1	1	YJ0800017	Socket
				FUNCTION LAMP BOARD-PY01
PY01	1	1	YD2908006	P. W. Board, Function Lamp (Print Only)
	1	1	ZZ2908006	P. W. Board Assembly
				PY01-MISCELLANEOUS
MY01 ≀ MY04	1	1	IN1006301	Lamp
MY05	1	1	IN1012011	Lamp
JY01 ≀ JY06	1	1	YP1000113	Plug
				GENERAL MISCELLANEOUS
0726	1	1	290805150	Guide K
0910	1	1	290826251	Pulley K
0914	1	1	51100306A	B. H. M. Screw B 3 x 6
M001	1	1	IM1104208	DC Meter, FM/AM
0630	1	1	288610701	Sheet
0622	1	1	285427101	Holder
0624	1	1	51570306B	P. H. Tapt Screw P 3 x 6 ST
M002	1	1	IN1008007	Lamp
J008	1	1	YJ0800019	Socket
0616	1	1	121000501	Clamper
0403	1		290816001	Bracket
0409	1	1	289611801	Spacer
0410	2	2	51100308S	B. H. M. Screw B 3 x 8
0411	2	2	53110303A	Hexagon Nut
0413	1		145525903	Bush
0414		1	284906702	Cap
0419		2	51060316A	P. H. M. Screw P 3 x 16
0420		2	53110303A	Hexagon Nut
0426	2	2	51100306S	B. H. M. Screw B 3 x 6
0427	2	2	53110303A	Hexagon Nut
0429	2	2	51100306S	B. H. M. Screw B 3 x 6
0430	2	2	53110303A	Hexagon Nut
0432	2	2	51100306S	B. H. M. Screw B 3 x 6
0433	2	2	53110303A	Hexagon Nut
0516	3	3	51100306S	B. H. M. Screw B 3 x 6
0519	1	1	145525903	Bush
G001	1		BF1040002	Printed Compo.
L002	1	1	LB3007526	Balun Coil
L006	1	1	LC1154004	Choke Coil, 150μH
F001	1		FS1005009	Fuse, 0.5A 250V (UL)
J001	1	1	YT0304009	Terminal, Ant.
J003	1	1	YT0201009	Terminal, Quadradial Output
J004	1	1	YT0202011	Terminal, Output
J006	1		YJ0800012	Socket, Fuse Holder
J007	1	1	YJ0400048	Socket, AC Outlet
J013	1	1	YL0102003	Terminal, 2P
W001	1		YC0240010	AC Cord
W001		1	YC0190003	AC Cord
C002		1	DF1756351	Film Cap., 0.056μF±20%
L001	1	1	LF1120038	Ant. Coil, AM
0503	1	1	257816052	Bracket K
0508	1	1	281927103	Holder, Ant.
0509	2	2	51100310S	B. H. M. Screw B 3 x 10
0510	2	2	53110303E	Hexagon Nut
0512	2	2	51100308S	B. H. M. Screw B 3 x 8
0513	2	2	53110303E	Hexagon Nut

REF. DESIG.	U	E	PART NO.	DESCRIPTION
0425	1	1	138200503	Clamper
1226	1	1	62030039W	Lug
R001	1		GT0522512	Resistor, 2.2MΩ ±5%, ½W
0703	1	1	290830201	Dial
0707	1	1	282705302	Cover
0812	1	1	290810401	Retainer
0813	1	1	290810601	Bearing
0815	2	2	51040306E	F. H. M. Screw F 3 x 6
0827	1	1	51064019A	Screw
1116		1	290812002	Insulator
1117		5	54060300R	T. L. Washer IR
1118		4	51570312B	P. H. Tapt Screw P 3 x 12
W004		1	YB0007001	Wire Material
W005		1	YB0007001	Wire Material
W006		1	YB0027001	Wire Material
J009		1	YL0106004	Terminal
1121		1	285216006	Bracket
1123		3	51062606A	P. H. M. Screw P 2.6 x 6
J010		1	YJ0800009	Socket, Fuse Holder
J011		1	YJ0800009	Socket, Fuse Holder
J012		1	YJ0800009	Socket, Fuse Holder
1127	1	1	138200503	Clamper
1325	1	1	138200503	Clamper
4236	1	1	287100501	Clamper
J002	1	1	YL0104001	Termianl, Ant.
C001	1	1	DK1840301	Ceramic Cap., 0.04μF, +100%,–0%
L004	1	1	LC1332002	Choke Coil, 3.3μH
L005	1	1	LC1332002	Choke Coil, 3.3μH
				SELECTOR SWITCH CIRCUIT BOARD –PS01
PS01	1	1	YD2908004	P. W. Board, Selector Switch (Print Only)
	1		ZZ2908004	P. W. Board Assembly
		1	ZZ2908804	P. W. Board Assembly
				PS01–RESISTORS
RS01	1	1	RC1002212	2.2Ω ±10%, ½W
RS02	1	1	RT0515214	1.5KΩ ±5%, ¼W
RS03	1	1	RA0104018	Trimming, 100KΩ (B)
RS04	1	1	RA0104018	Trimming, 100KΩ (B)
				PS01–CAPACITORS
CS01	1		DF1522205	Film, 2200PF ±5%, 50V
CS02	1		DF1522205	Film, 2200PF ±5%, 50V
CS03	1	1	EM4740251	Electroly, 0.47μF, 25V
CS01		1	DF1510205	Film, 1000PF ±5%
CS02		1	DF1510205	Film, 1000PF ±5%
				PS01–MISCELLANEOUS
SS01	1	1	SP0603008	Pushswitch
JS01 ≀ JS20	1	1	YP1000113	Plug

REF. DESIG.	U	E	PART NO.	DESCRIPTION
				MODE SWITCH CIRCUIT BOARD-PT01
PT01	1	1	YD2908005	P. W. Board, Mode Switch (Print Only)
	1	1	ZZ2908005	P. W. Board Assembly
				PT01–MISCELLANEOUS
RT01	1	1	RT0556414	Resistor, 560KΩ ±5%, ¼W
RT02	1	1	RT0539414	Resistor, 390KΩ ±5%, ¼W
RT03	1	1	RT0524314	Resistor, 24KΩ ±5%, ¼W
RT04	1	1	RT0510414	Resistor, 100KΩ ±5%, ¼W
CT01	1	1	EA4760109	Electroly Cap., 47μF 10V
HT01	1	1	HT3037204	Transistor, 2SC372 (Y)
ST01	1	1	SP0202014	Pushswitch
JT01 ≀ JT08	1	1	YP1000113	Plug
				GENERAL MISCELLANEOUS
S001	1	1	SP0301003	Pushswitch
0203	4	4	293205701	Lug
0204	4	4	51490410S	B. H. M. Screw F.S.
0332		2	951061111	Label, Fuse (0.3A)
0333		1	951061103	Label, Fuse (3A)
0335	1	1	290886101	Label, Marantz
0531	6	6	51100306S	B. H. M. Screw B 3 x 6
0831	1	1	290810602	Bearing
0832	2	2	51040306E	F. H. M. Screw F 3 x 6
1003	1	1	290810550	Chassis K
1013	2	2	290810101	Support
1014	2	2	54040402N	Spring Washer
1018	2	2	51100306A	B. H. M. Screw B 3 x 6
1019	2	2	51100306A	B. H. M. Screw B 3 x 6
1020	2	2	51100306A	B. H. M. Screw B 3 x 6
1023	4	4	51570308B	P. H. Tapt Screw P 3 x 6 ST
1026	2	2	289610401	Retainer
1027	2	2	51570410B	P. H. Tapt Screw P 4 x 10 ST
1028	1	1	290812001	Insulator
1029	2	2	54040402N	Spring Washer
1103	4	4	51570306S	P. H. Tapt Screw P 3 x 6 ST
1104	2	2	51060306S	P. H. M. Screw P 3 x 6
1105	1	1	288116003	Bracket
1109	4	4	51100306S	P. H. M. Screw P 3 x 6
1122		2	51570306B	P. H. Tapt Screw P 3 x 6 ST
1126	4	4	288600506	Clamper
1128	1	1	288600504	Clamper
1129	1	1	51570306B	P. H. Tapt Screw P 3 x 6 ST
1131	4	4	288600506	Clamper
1132	1	1	288600504	Clamper
1135	1	1	288600506	Clamper
1203	2	2	51100304A	B. H. M. Screw B 3 x4
1204	4	4	51570306B	P. H. Tapt Screw P 3 x 6 ST
1216	1	1	138200503	Clamper
1217	1	1	53110303A	Hexagon Nut
1218	1	1	54050300R	T. L. Washer OR
1221	1	1	138200503	Clamper
1222	1	1	51570306B	P. H. Tapt Screw P 3 x 6 ST
1223	1	1	54050300R	T. L. Washer OR
1227	1	1	51570306B	P. H. Tapt Screw P 3 x 6 ST
1231	1	1	51570306B	P. H. Tapt Screw P 3 x 6 ST
1232	1	1	54050300R	T. L. Washer OR
1332	2	2	121000501	Clamper
1333	2	2	51570306B	P. H. Tapt Screw P 3 x 6 ST
1334	2	2	54050300R	T. L. Washer OR

REF. DESIG.	U	E	PART NO.	DESCRIPTION
A001	1	1	AV0120202	FM Front End Assembly
				FM FRONT END CIRCUIT BOARD–P100
P100	1	1	YD2908001	P. W. Board, FM Front End (Print Only)
	1	1	ZZ2908001	P. W. Board Assembly
				P100–RESISTORS
				All resistors are ±5% and ¼W.
R101	1	1	RT0510414	100KΩ
R102	1	1	RT0510514	1MΩ
R103	1	1	RT0510114	100Ω
R104	1	1	RT0510114	100Ω
R105	1	1	RT0510314	10KΩ
R106	1	1	RT0533214	3.3KΩ
R107	1	1	RT0522214	2.2KΩ
R108	1	1	RT0510314	10KΩ
R109	1	1	RT0510114	100Ω
R110	1	1	RT0510314	10KΩ
R111	1	1	RT0510314	10KΩ
R112	1	1	RT0522214	2.2KΩ
R113	1	1	RT0510114	100Ω
				P100–CAPACITORS
C101	1	1	CT1120003	Trimming, 12PF
C102	1	1	CT1120003	Trimming, 12PF
C103	1	1	CT1120003	Trimming, 12PF
C104	1	1	CT1120003	Trimming, 12PF
C108	1	1	CA4330001	Variable, AM3G, FM4G
C109	1	1	DD1620001	Ceramic, 20PF ±10%
C110	1	1	DK1710201	Ceramic, 1000PF ±20%
C111	1	1	DK1710301	Ceramic, 0.01μF ±20%
C112	1	1	DK1710301	Ceramic, 0.01μF ±20%
C113	1	1	DD1522001	Ceramic, 22PF ±5%
C114	1	1	DD1620001	Ceramic, 20PF ±10%
C115	1	1	DD1205001	Ceramic, 5PF ±0.5PF
C116	1	1	DD1518001	Ceramic, 18PF ±5% SL
C117	1	1	DK1710201	Ceramic, 1000PF ±20%
C118	1	1	DK1710301	Ceramic, 0.01μF ±20%
C119	1	1	DD1650001	Ceramic, 50PF ±10%
C120	1	1	DK1710301	Ceramic, 0.01μF ±20%
C121	1	1	DD1001003	Ceramic, 1PF ±0.25PF CH
C122	1	1	DD1615009	Ceramic, 15PF (RH)
C123	1	1	DD1610004	Ceramic 10PF (RH)
C124	1	1	DD1207005	Ceramic, 7PF ±1PF (RH)
C125	1	1	DD1615009	Ceramic, 15PF
C126	1	1	DD1610004	Ceramic, 10PF (RH)
C127	1	1	DK1710301	Ceramic, 0.01μF ±20%
C128	1	1	DK1710301	Ceramic, 0.01μF ±20%
				P100–MISCELLANEOUS
L104	1	1	LO1027901	OSC Coil, FM
L105	1	1	LI1001901	IFT, FM
H101	1	1	HF200551D	FET, 2SK55 (D)
H102	1	1	HT305351B	Transistor, 2SC535 (B)
H103	1	1	HT304611B	Transistor, 2SC461 (B)
J101 ~ J106	1	1	YP1000114	Plug
				GENERAL MISCELLANEOUS
L003	1		TS1601501	Power Transf.

REF. DESIG.	U	E	PART NO.	DESCRIPTION
L003		1	TS1601502	Power Transf.
0111	4	4	52017039J	Bolt
0116	6	6	281815401	Knob
0124	4	4	51480406S	B. H. M. Screw F
0131	1	1	282825702	Lid
0133	8	8	51100406S	B. H. M. Screw B 4 x 6
0303	1		290826501	Indicator, Name Plate
0305		1	290826503	Indicator, Name Plate
0312	2	2	51100305S	B. H. M. Screw B 3 x 5
0316	1	1	257886101	Label, UL Caution
0317	1	1	257886102	Label, Do Not Remove...
0318	1	1	257886103	Label, See, Marking ....
0320	1	1	250626506	Indicator, Do Not Use ....
0323	1		951110103	Label, UL
0324	1		951091102	Label, UL Factory Co. No.
0710	1	1	287311802	Spacer
0717	1	1	290826901	Protector
0718	2	2	51570306B	P. H. Tapt Screw P 3 x 6 ST
0732	1	1	290805102	Guide
0733	2	2	51102605E	B. H. M. Screw B 2.6 x 5
0819	1	1	290826201	Pulley
0821	2	2	59058002G	Washer
0823	1	1	53110303E	Hexagon Nut
0824	1	1	54040302N	Spring Washer
0828	2	2	51470306A	B. H. M. Screw S
1208	1	1	290810901	Shield
1209	5	5	51570306S	P. H. Tapt Screw P 3 x 6 ST
1320	1	1	56382540G	Eyelet
1323	1	1	290825901	Bush
1523	4		952281501	Serial No. Card
1525		4	952301511	Serial No. Card
F001	1		FS1005007	Fuse, 0.5A
F001		1	FS1030004	Fuse, 3A
F002		1	FS1005003	Fuse, 0.5A
F003		1	FS1005003	Fuse, 0.5A
1403	1		290885101	Instructions, Set
1404		1	290885121	Instructions, Set
1409	1		290885601	Schematic Diagram
1411		1	290885603	Schematic Diagram
1416	1	1	288585107	Instructions, Set Mounting
1417	1	1	288785108	Instructions, Accessories
1418	1	1	281885104	Instructions, Partitioner
1423	1	1	257785401	Guarantee Card
1424	1	1	257785102	Instructions, Red Tag
1425	1		257781301	Envelope
1431		1	281881301	Envelope
1503	1	1	290880101	Packing Case Inner
1504	1	1	290880111	Packing Case, Outer
1509	2	2	289180301	Partitioner
1512	1	1	901383033	Polyethylen Bag, Set
1514	1	1	901302501	Polyethylen Bag, Printed Matter
1515	1	1	901302501	Polyethylen Bag, Accessories
1517	1	1	102980401	Sleeve
1518	1	1	956000004	Hang Tag
1519	1	1	281905601	Buffer
1520	2	2	273182101	Silicagel
1531	1	1	ZA0200007	Ext. Antenna, FM
1532	1	1	ED0120006	Connective Cord

8. TECHNICAL SPECIFICATIONS

FM SECTION

Tuning Frequency Range	88 – 108MHz
IHFM Usable Sensitivity	2.0μV
IHF Selectivity	60dB
Capture Ratio	1.5dB
Image Rejection Ratio at 106MHz	70dB
Signal to Noise Ratio (Mono)	70dB
Signal to Noise Ratio (Stereo)	60dB
Total Harmonic Distortion (Mono)	0.15%
Total Harmonic Distortion (Stereo)	0.3%
Frequency Response (ref. 50μ sec. de-emphasis)	±1dB, 50Hz – 15KHz ± 1dB
Stereo Separation at 1KHz	42dB

AM SECTION

Tuning Frequency Range	535 – 1605KHz
Usable Sensitivity	20μV
Selectivity	26dB
Image Rejection Ratio	70dB
Signal to Noise Ratio	50dB
Frequency Response (–3dB down)	50Hz – 2.5KHz
Total Harmonic Distortion	1%

GENERAL

Power Requirements	220 Volts ∿ 50/60Hz (This unit can be converted by a qualified technician to operate on 110/120/240 V ∿ 50/60Hz)
Power Consumption	20 Watts
Dimensions – Panel Width	14-11/64 inches
– Panel Height	4-23/32 inches
– Depth	11-1/32 inches
Weight – Unit alone	14.1 lbs.
– Packed for Shipment	21.6 lbs.

* These specifications and exterior designs may be changed for improvement without advance notice.

NOTE

SERVICE INFORMATION FOR EUROPEAN MODEL

The information contained here in included the rear panel and main chassis component locations, schematic diagram, voltage conversion and FTZ regulation.

For the circuit description, alignment method and repairing hints, refer to the original service manual.

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Rear Panel Adjustments and Facilities Locations 26
Main Chassis Component Locations (Bottom View) 26
Schematic Diagram .... 27~28
Voltage Conversion 29
FTZ Regulation 29

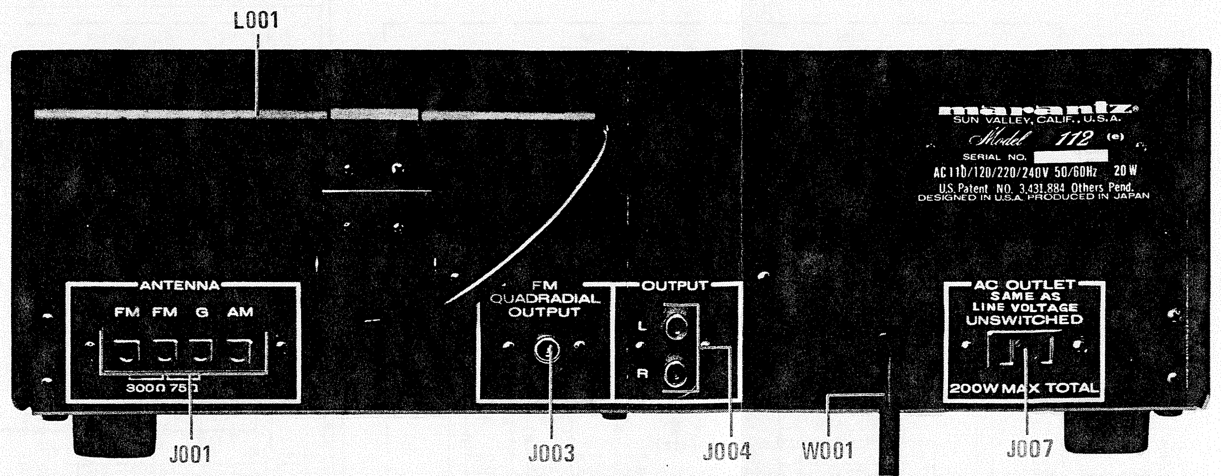
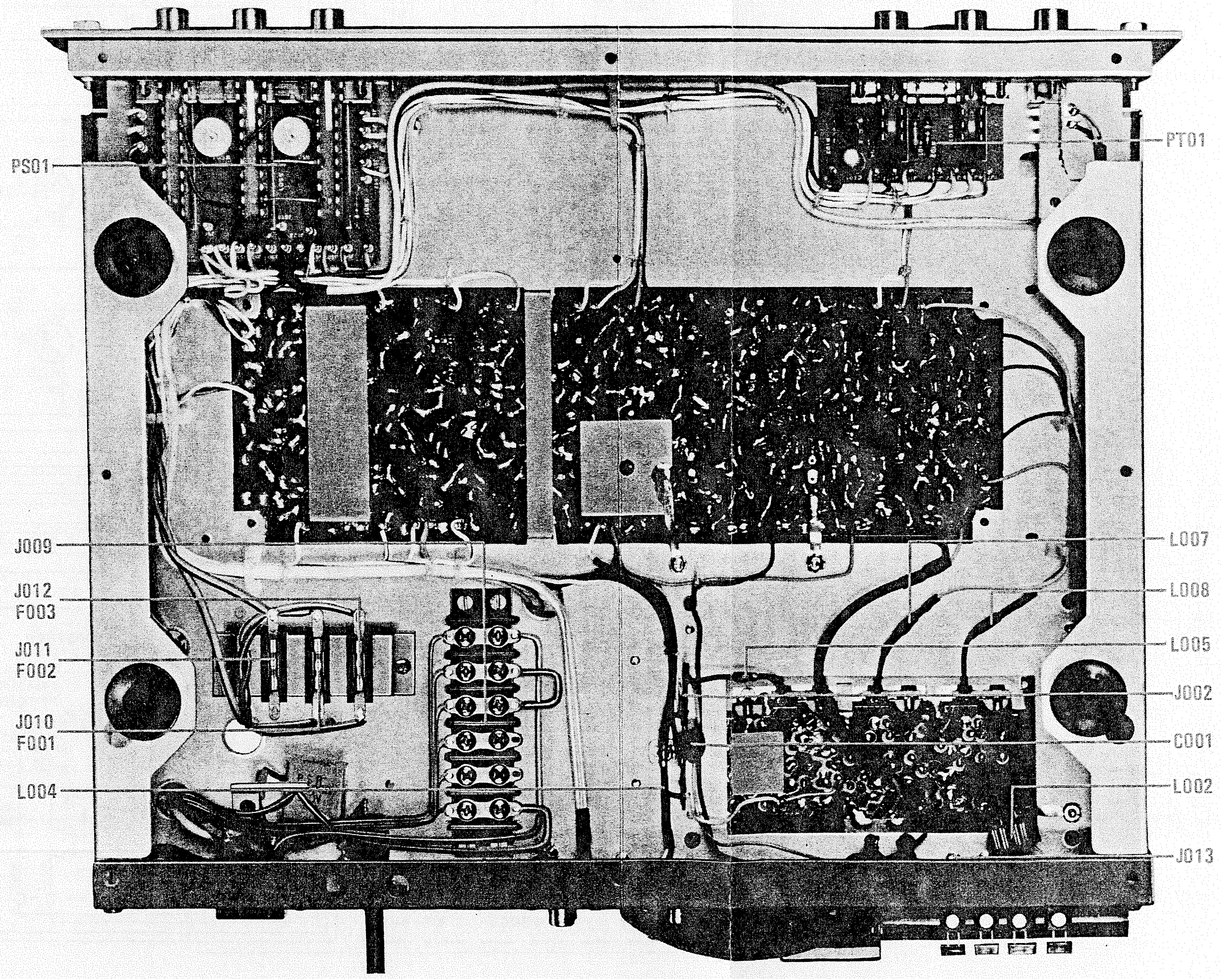

L001
marantz®
SUN VALLEY, CALIF., U.S.A.
Model 112 (e)
SERIAL NO.
AC 110/120/220/240V 50/60Hz 20 W
U.S. Patent NO. 3.431.884 Others Pend.
DESIGNED IN U.S.A. PRODUCED IN JAPAN
ANTENNA
FM FM G AM
300Ω 75Ω
FM QUADRADIAL OUTPUT
OUTPUT
L
R
AC OUTLET SAME AS LINE VOLTAGE UNSWITCHED
200W MAX TOTAL
J001
J003
J004
W001
J007

Figure 16. Rear Panel Adjustment and Component Locations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PT01
J009
J012
F003
J011
F002
J010
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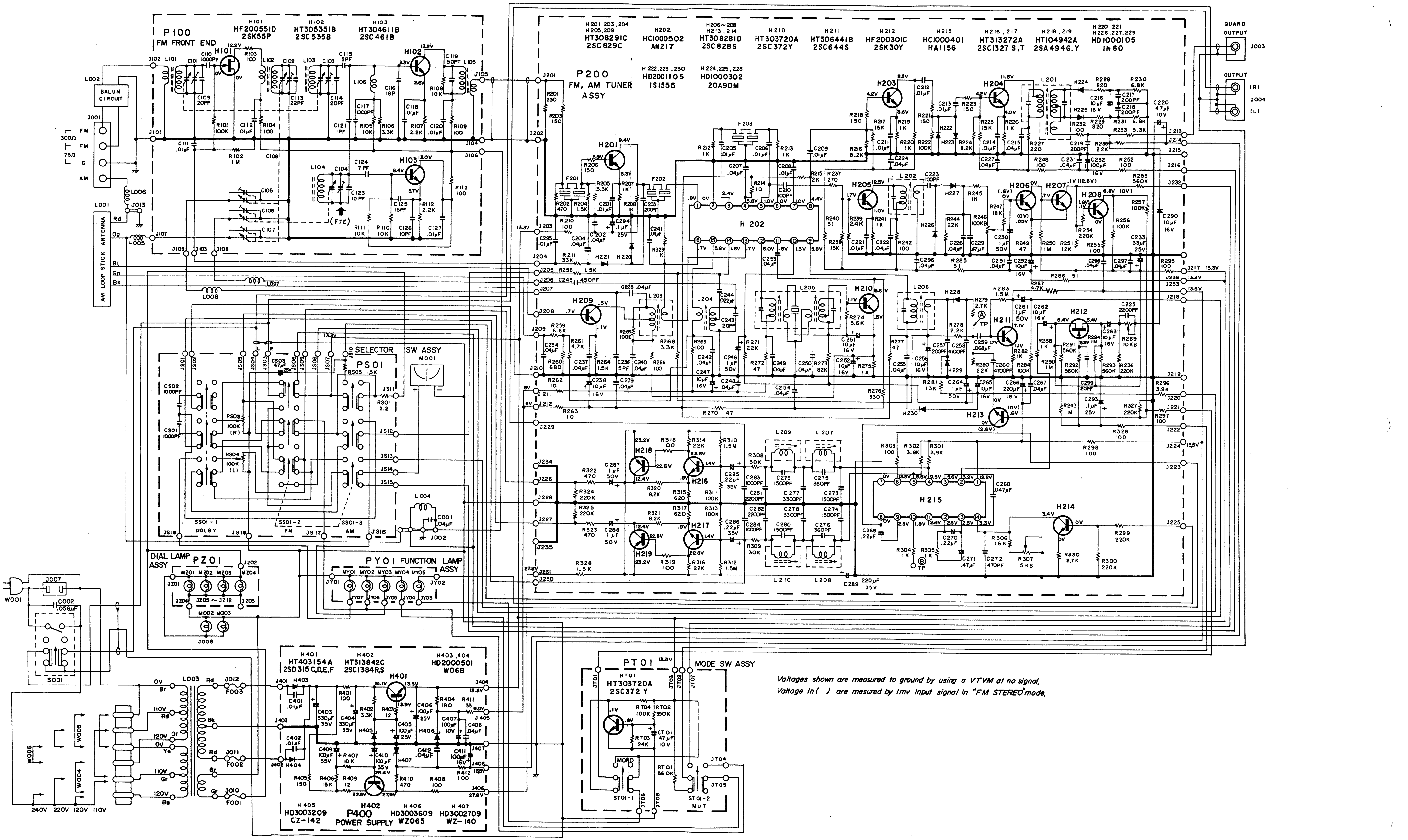
L007
L008
L005
J002
C001
L002
J013

Figure 17. Main Chassis Component Locations (Bottom View)


P100
FM FRONT END
H101 HF200551D 2SK55P
H102 HT305351B 2SC535B
H103 HT304611B 2SC461B
P200
FM, AM TUNER ASSY
H201 203, 204 H205, 209 HT308291C 2SC829C
H202 HC1000502 AN217
H206 ~ 208 H213, 214 HT308281D 2SC828S
H210 HT303720A 2SC372Y
H211 HT306441B 2SC644S
H212 HF200301C 2SK30Y
H215 HC1000401 HA1156
H216, 217 HT313272A 2SC1327 S,T
H218, 219 HT104942A 2SA494G,Y
H220, 221 H226, 227, 229 HD1000105 IN60
H222, 223, 230 HD2001105 1S1555
H224, 225, 228 HD1000302 20A90M
H202
H215
QUARD OUTPUT
OUTPUT
J003
J004
(R)
(L)
BALUN CIRCUIT
300Ω
75Ω
FM
G
AM
AM LOOP STICK ANTENNA
Rd
Og
Bl
Gn
Bk
L007
L008
SELECTOR
PS01
SW ASSY
M001
SS01-1 DOLBY
SS01-2 FM
SS01-3 AM
DIAL LAMP ASSY
PZ01
PY01 FUNCTION LAMP ASSY
J008
W001
S001
P400
POWER SUPPLY
H401 HT403154A 2SD315 C,D,E,F
H402 HT313842C 2SC1384R,S
H403, 404 HD2000501 W06B
H405 HD3003209 CZ-142
H406 HD3003609 WZ065
H407 HD3002709 WZ-140
240V 220V 120V 110V
W005
W006
W004
PT01
MODE SW ASSY
HT01 HT303720A 2SC372 Y
MONO
ST01-1
ST01-2 MUT

Voltages shown are measured to ground by using a VTVM at no signal.
Voltage in ( ) are mesured by 1mv input signal in "FM STEREO" mode.

Figure 18. Schematic Diagram

VOLTAGE CONVERSION

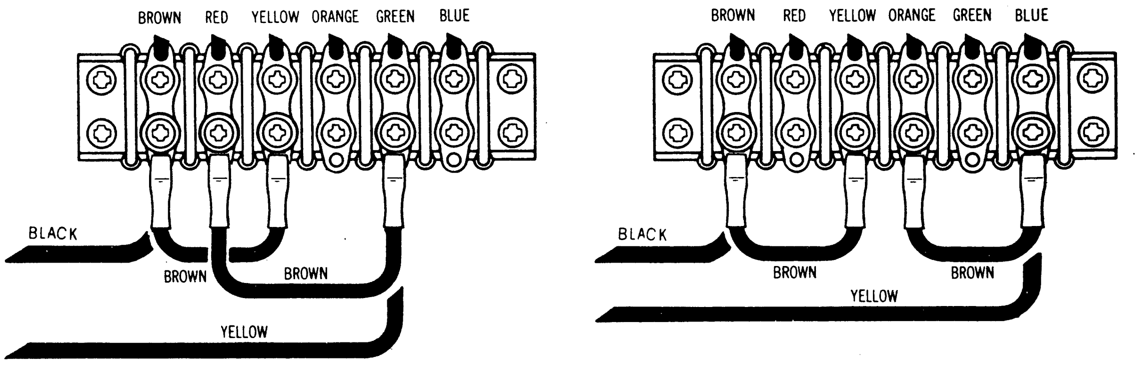
This model is equipped with a universal power transformer to permit operation at 110, 120, 220 and 240 V AC 50 to 60 Hz.

To convert the unit to the required voltage perform the following steps:

(1) Remove the lid (top).

(2) Change the jumper wires as illustrated below for the required AC voltage.

CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.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GREEN
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BROWN
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YELLOW
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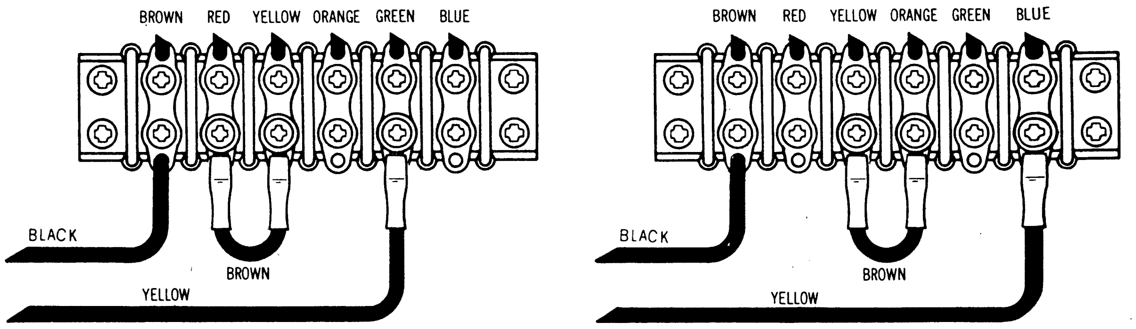
RED
YELLOW
ORANGE
GREEN
BLUE
BLACK
BROWN
BROWN
YELLOW

For 110V Operation

For 120V Operation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YELLOW
ORANGE
GREEN
BLUE
BLACK
BROWN
YELLOW
BROWN
RED
YELLOW
ORANGE
GREEN
BLUE
BLACK
BROWN
YELLOW

For 220V Operation

For 240V Operation

Figure 19. Voltage Conversion Chart

FTZ REGULATION

Instruction for the use in the range other than specified in FTZ codes

Achtung für die Leute, die in dem Gebiet wohnen, wo die FTZ-Bestimmungen vorherrschend sind.

Sollte das Gerät auch für Frequenzen auszerhalb des in den FTZ-Bestimmungen angegebenen Bereiches empfangebereit sein, bitten wir, den Bereich durch Nachstellen des Kernes in der Oszillatorspule (in der Abbildung mit "FTZ" gekennzeichnet) so zu korrigieren, dass er den Bestimmungen entspricht.